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(12) **United States Patent**
Gurule

(10) **Patent No.: US 11,551,441 B2**
(45) **Date of Patent: Jan. 10, 2023**

(54) **SYSTEMS AND METHODS FOR A CHRONOLOGICAL-BASED SEARCH ENGINE**

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(73) Assignee: **Enviropedia, Inc.**, Philadelphia, PA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 79 days.

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(2) Date: **Jun. 6, 2019**

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PCT Pub. Date: **Jun. 14, 2018**

(65) **Prior Publication Data**

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(51) **Int. Cl.**

G06V 20/00	(2022.01)
G06V 20/20	(2022.01)
G06F 16/9038	(2019.01)
G02B 27/00	(2006.01)

(Continued)

(52) **U.S. Cl.**
CPC ***G06V 20/20*** (2022.01); ***G02B 27/0093*** (2013.01); ***G02B 27/017*** (2013.01); ***G06F 16/9038*** (2019.01); ***G06T 19/006*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

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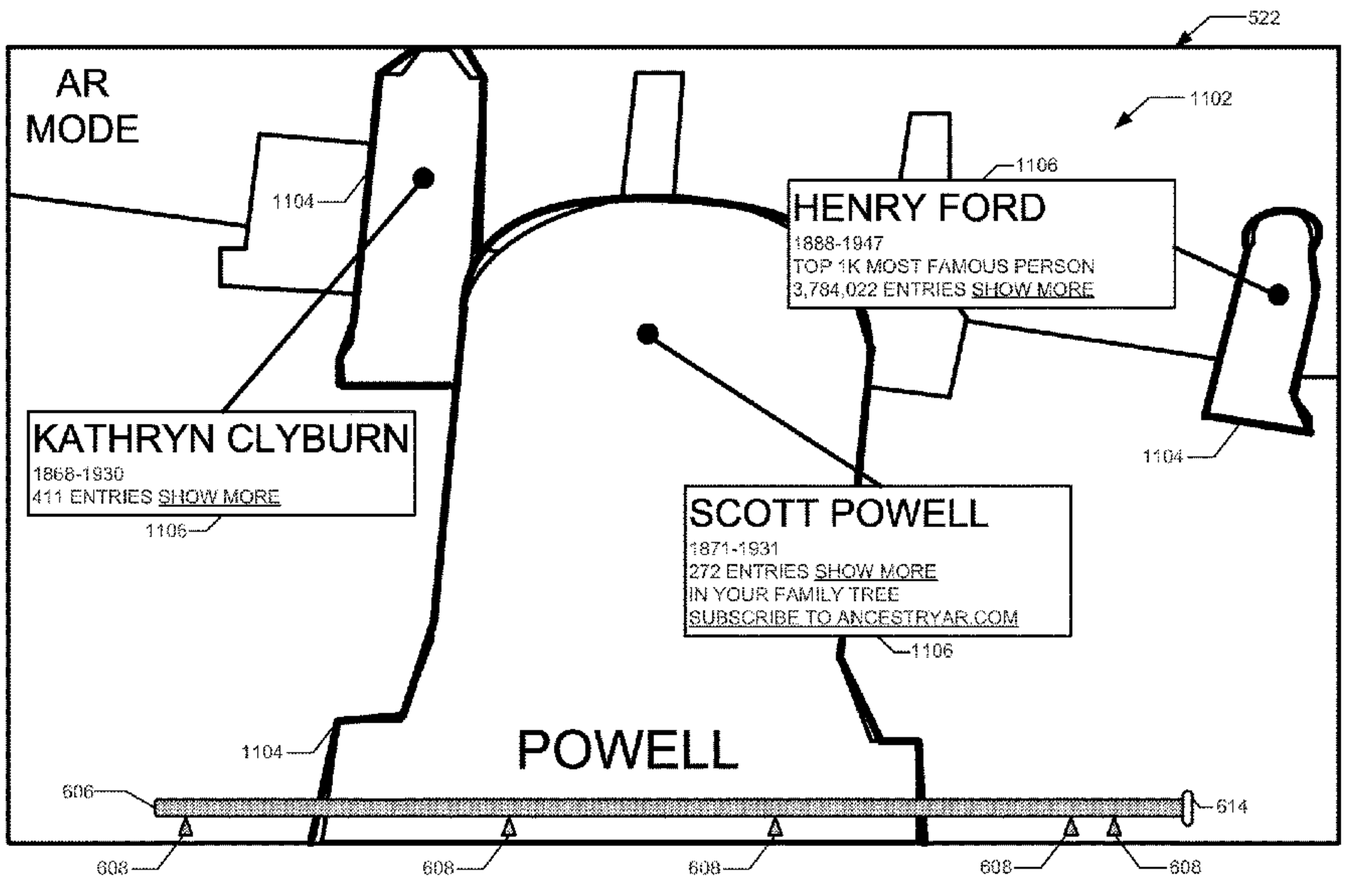
(57) **ABSTRACT**

Methods, apparatus, and database management systems are disclosed for providing, organizing, and present database search results and, more specifically, systems and methods for a chronological-based search engine. One method includes presenting live image data being captured by a camera of the end-user device. The method also includes determining a pose of the end-user device. The pose including a location of the end-user device. Additionally, the method includes sending the pose of the end-user device to an augmented reality platform entity and receiving closed captioning data from the augmented reality platform entity. The closed captioning data is based on the location of the end-user device and includes indications of first topics within the closed captioning data. The method includes superimposing the closed captioning data onto the live image data.

18 Claims, 27 Drawing Sheets



(51) **Int. Cl.**
G02B 27/01 (2006.01)
G06T 19/00 (2011.01)

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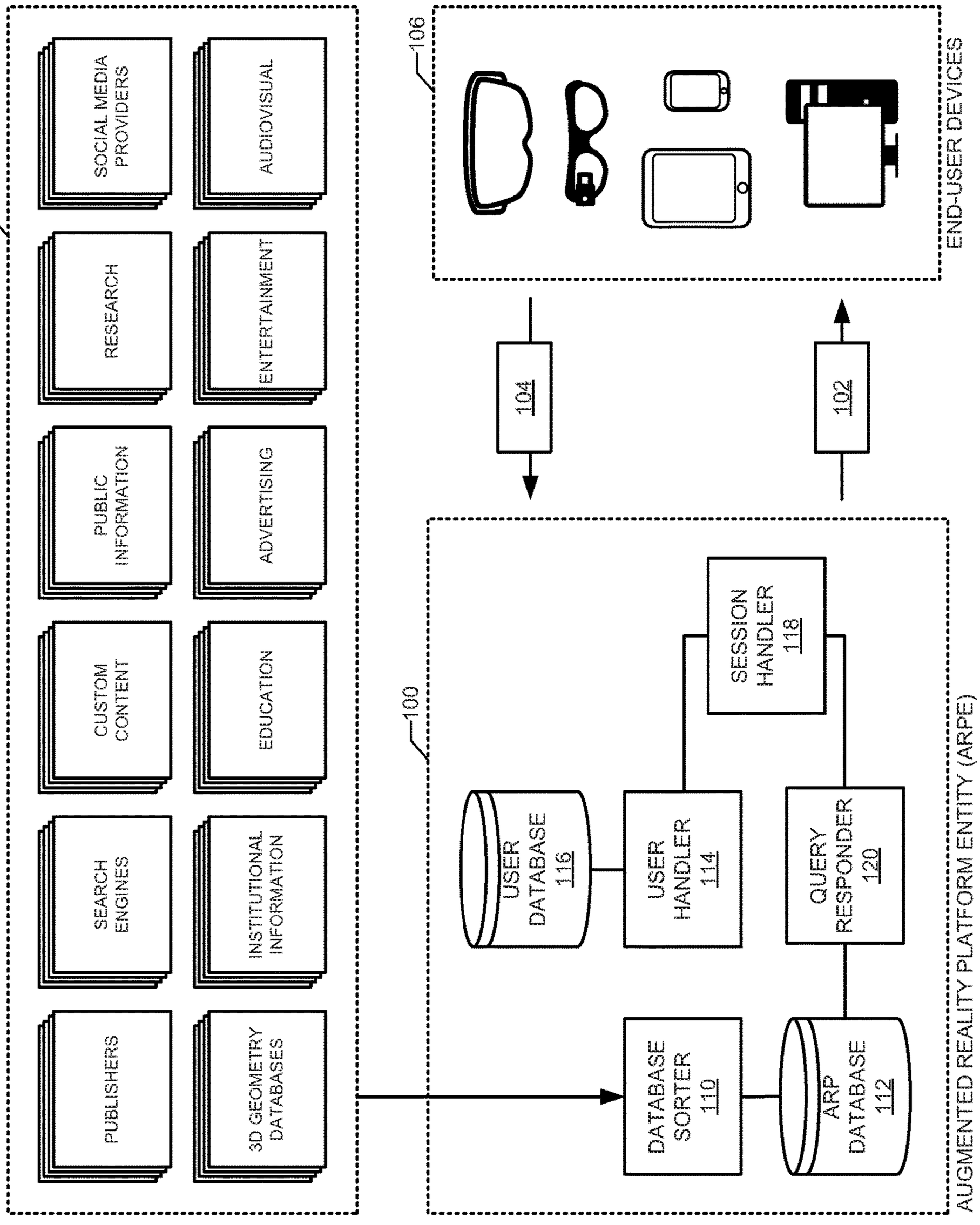

106
END-USER DEVICES
104
102
100
AUGMENTED REALITY PLATFORM ENTITY (ARPE)
SESSION HANDLER 118
USER DATABASE 116
USER HANDLER 114
QUERY RESPONDER 120
DATABASE SORTER 110
ARP DATABASE 112
108
CONTENT DATABASE PROVIDERS
SOCIAL MEDIA PROVIDERS
AUDIOVISUAL
RESEARCH
ENTERTAINMENT
PUBLIC INFORMATION
ADVERTISING
CUSTOM CONTENT
EDUCATION
SEARCH ENGINES
INSTITUTIONAL INFORMATION
PUBLISHERS
3D GEOMETRY DATABASES

FIG. 1

200

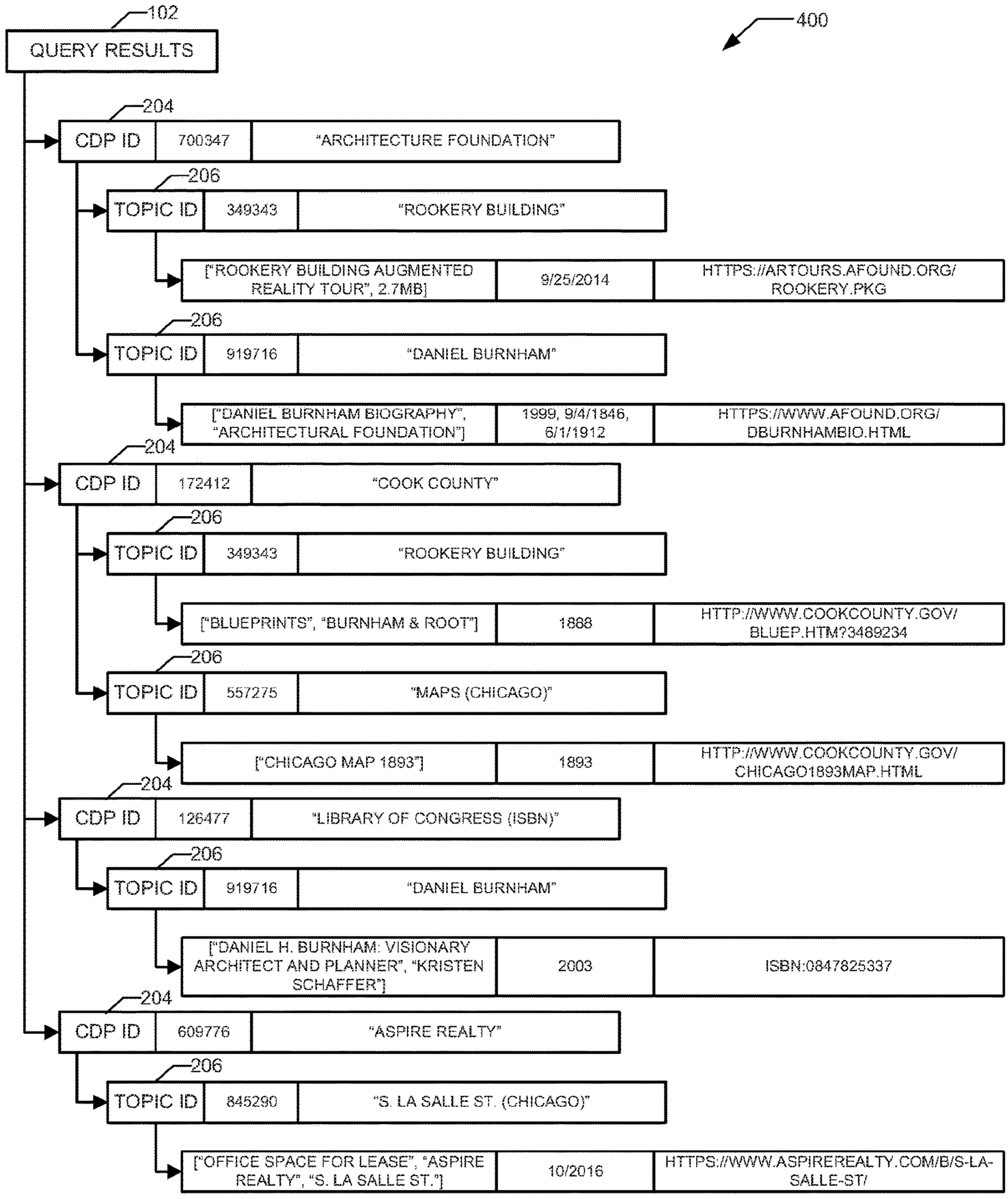
202 RECORD ID	204 CDP ID	206 TOPIC ID(S)	208 TOPIC METADATA	210 TOPIC DATE(S)	212 URI
219203897	700347	349343	["ROOKERY BUILDING AUGMENTED REALITY TOUR", 2.7MB]	9/25/2014	HTTPS://ARTOURS.AFOUND.ORG/ROOKERY.PKG
284804855	172412	349343	["BLUEPRINTS", "BURNHAM & ROOT"]	1888	HTTP://WWW.COOKCOUNTY.GOV/BLUEP.HTM?3489234
356964826	700347	919716	["DANIEL BURNHAM BIOGRAPHY", "ARCHITECTURAL FOUNDATION"]	1999, 9/4/1846, 6/1/1912	HTTPS://WWW.AFOUND.ORG/DBURNHAMBIO.HTML
447791949	126477	919716	["DANIEL H. BURNHAM: VISIONARY ARCHITECT AND PLANNER", "KRISTEN SCHAFFER"]	2003	ISBN:0847825337
600928467	172412	557275	["CHICAGO MAP 1893"]	1893	HTTP://WWW.COOKCOUNTY.GOV/CHICAGO1893MAP.HTML
688051446	609776	845290	["OFFICE SPACE FOR LEASE", "ASPIRE REALTY", "S. LA SALLE ST."]	10/2016	HTTPS://WWW.ASPIREREALTY.COM/B/S-LA-SALLE-ST/

FIG. 2

300

302 SESSION ID	304 USER ID	306 QUERY DATA	308 DEVICE POSE DATA
Y98W2CG9Q7	114520	STRING:="ROOKERY BUILDING"	[41.879436, -87.632228, 165, 67]

FIG. 3


102
QUERY RESULTS
400
204
CDP ID
700347
"ARCHITECTURE FOUNDATION"
206
TOPIC ID
349343
"ROOKERY BUILDING"
["ROOKERY BUILDING AUGMENTED REALITY TOUR", 2.7MB]
9/25/2014
HTTPS://ARTOURS.AFOUND.ORG/ROOKERY.PKG
206
TOPIC ID
919716
"DANIEL BURNHAM"
["DANIEL BURNHAM BIOGRAPHY", "ARCHITECTURAL FOUNDATION"]
1999, 9/4/1846, 6/1/1912
HTTPS://WWW.AFOUND.ORG/DBURNHAMBIO.HTML
204
CDP ID
172412
"COOK COUNTY"
206
TOPIC ID
349343
"ROOKERY BUILDING"
["BLUEPRINTS", "BURNHAM & ROOT"]
1888
HTTP://WWW.COOKCOUNTY.GOV/BLUEP.HTM?3489234
206
TOPIC ID
557275
"MAPS (CHICAGO)"
["CHICAGO MAP 1893"]
1893
HTTP://WWW.COOKCOUNTY.GOV/CHICAGO1893MAP.HTML
204
CDP ID
126477
"LIBRARY OF CONGRESS (ISBN)"
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919716
"DANIEL BURNHAM"
["DANIEL H. BURNHAM: VISIONARY ARCHITECT AND PLANNER", "KRISTEN SCHAFFER"]
2003
ISBN:0847825337
204
CDP ID
609776
"ASPIRE REALTY"
206
TOPIC ID
845290
"S. LA SALLE ST. (CHICAGO)"
["OFFICE SPACE FOR LEASE", "ASPIRE REALTY", "S. LA SALLE ST."]
10/2016
HTTPS://WWW.ASPIREREALTY.COM/B/S-LA-SALLE-ST/

FIG. 4

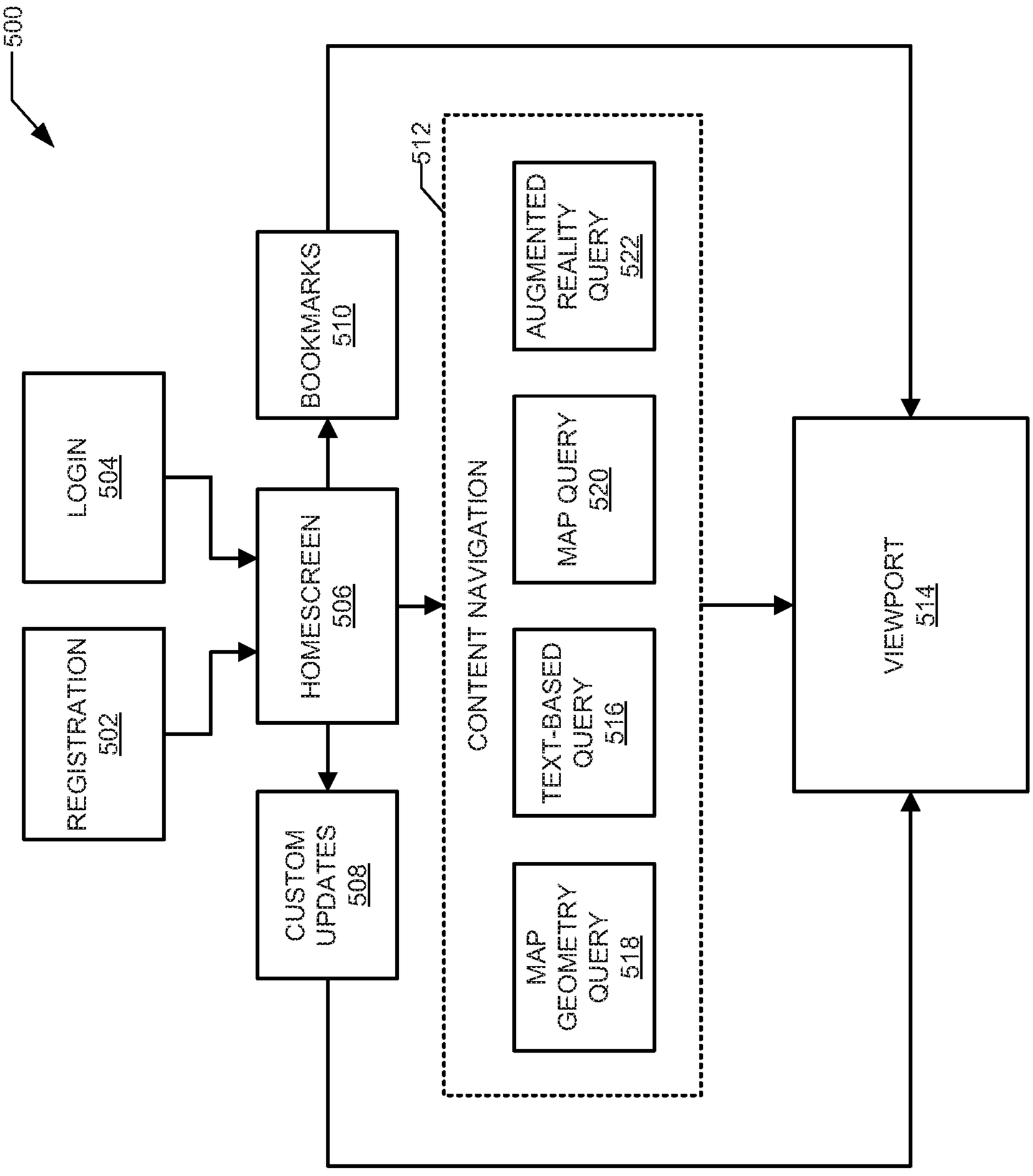
500
REGISTRATION 502
LOGIN 504
HOMESCREEN 506
BOOKMARKS 510
CUSTOM UPDATES 508
512
CONTENT NAVIGATION
TEXT-BASED QUERY 516
MAP QUERY 520
AUGMENTED REALITY QUERY 522
MAP GEOMETRY QUERY 518
VIEWPORT 514

FIG. 5

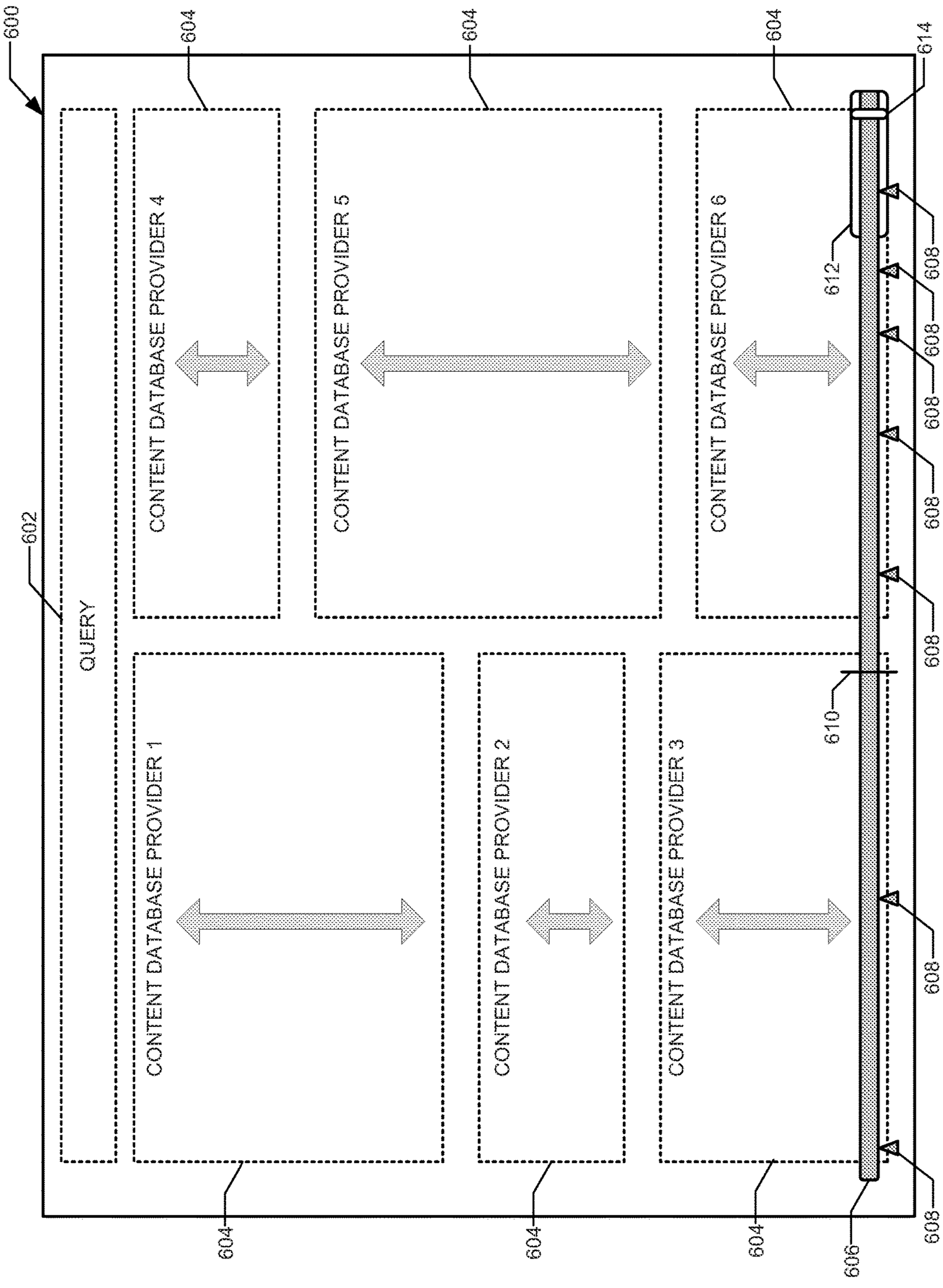
600
602
QUERY
604
CONTENT DATABASE PROVIDER 1
CONTENT DATABASE PROVIDER 2
CONTENT DATABASE PROVIDER 3
CONTENT DATABASE PROVIDER 4
CONTENT DATABASE PROVIDER 5
CONTENT DATABASE PROVIDER 6
606
608
610
612
614

FIG. 6

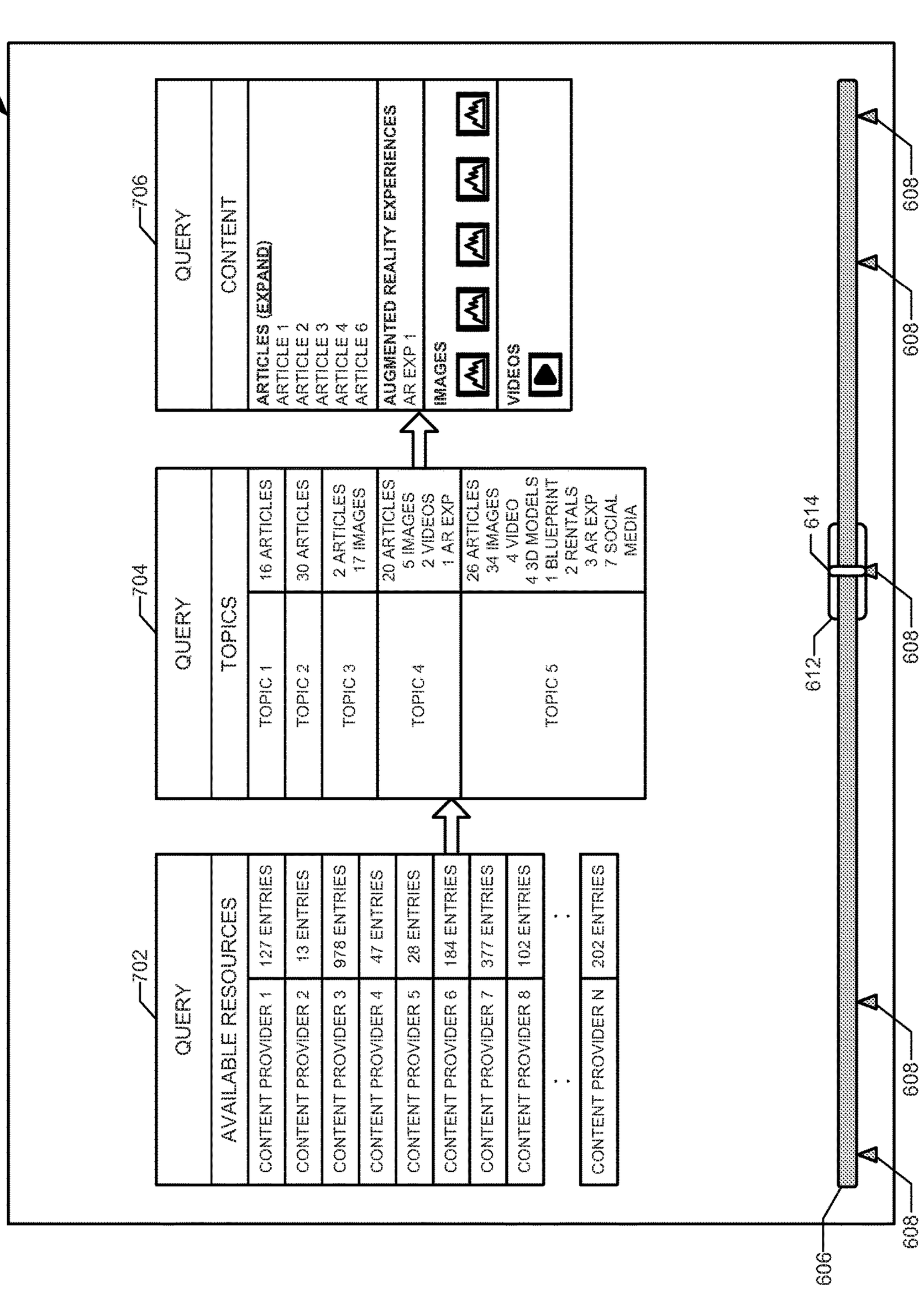
700
702
QUERY
AVAILABLE RESOURCES
CONTENT PROVIDER 1
127 ENTRIES
CONTENT PROVIDER 2
13 ENTRIES
CONTENT PROVIDER 3
978 ENTRIES
CONTENT PROVIDER 4
47 ENTRIES
CONTENT PROVIDER 5
28 ENTRIES
CONTENT PROVIDER 6
184 ENTRIES
CONTENT PROVIDER 7
377 ENTRIES
CONTENT PROVIDER 8
102 ENTRIES
CONTENT PROVIDER N
202 ENTRIES
704
QUERY
TOPICS
TOPIC 1
16 ARTICLES
TOPIC 2
30 ARTICLES
TOPIC 3
2 ARTICLES
17 IMAGES
TOPIC 4
20 ARTICLES
5 IMAGES
2 VIDEOS
1 AR EXP
TOPIC 5
26 ARTICLES
34 IMAGES
4 VIDEO
4 3D MODELS
1 BLUEPRINT
2 RENTALS
3 AR EXP
7 SOCIAL MEDIA
706
QUERY
CONTENT
ARTICLES (EXPAND)
ARTICLE 1
ARTICLE 2
ARTICLE 3
ARTICLE 4
ARTICLE 6
AUGMENTED REALITY EXPERIENCES
AR EXP 1
IMAGES
VIDEOS
606
608
612
614

FIG. 7

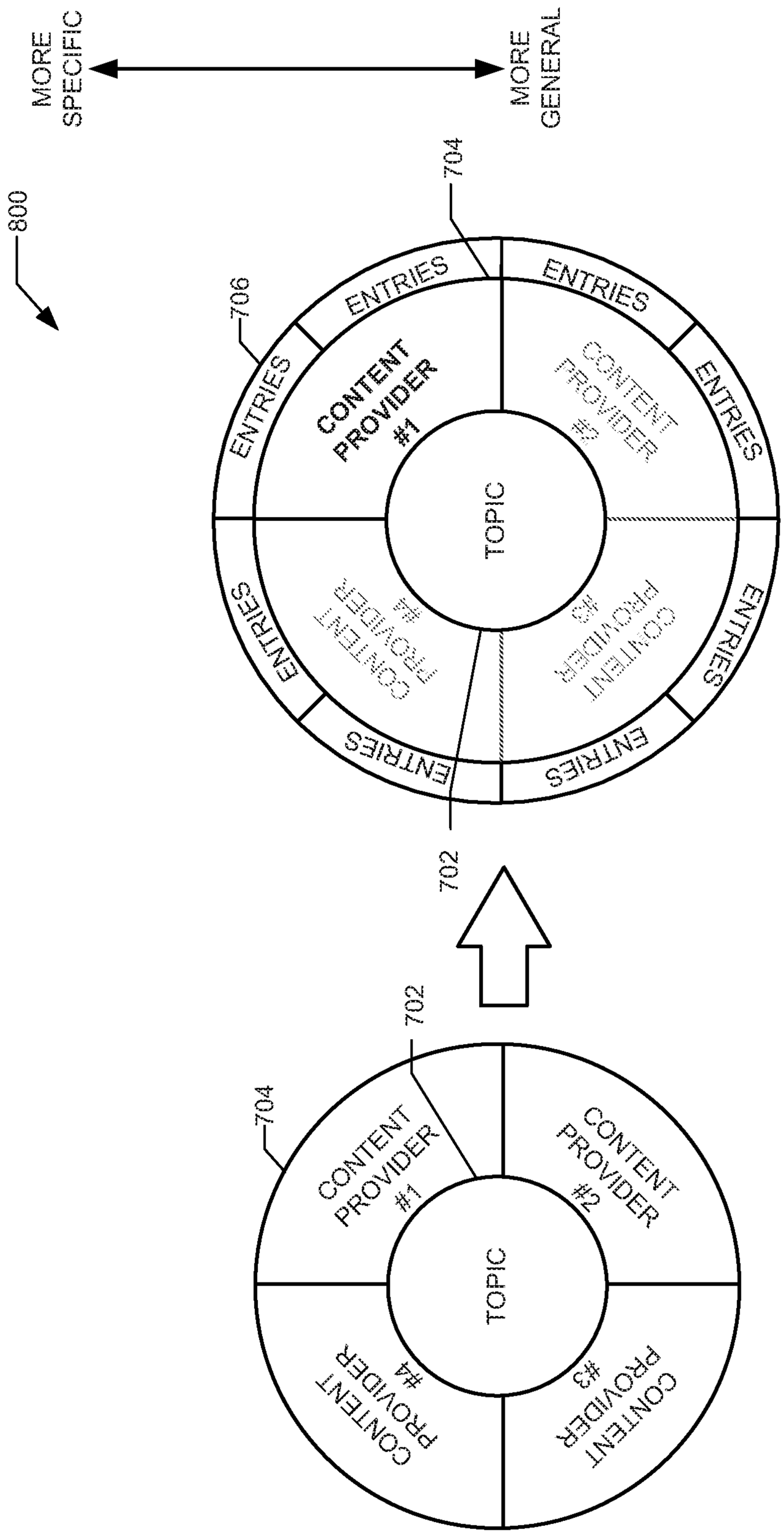
MORE SPECIFIC
MORE GENERAL
800
704
706
ENTRIES
CONTENT PROVIDER #1
CONTENT PROVIDER #2
CONTENT PROVIDER #3
CONTENT PROVIDER #4
TOPIC
702
702
704

FIG. 8

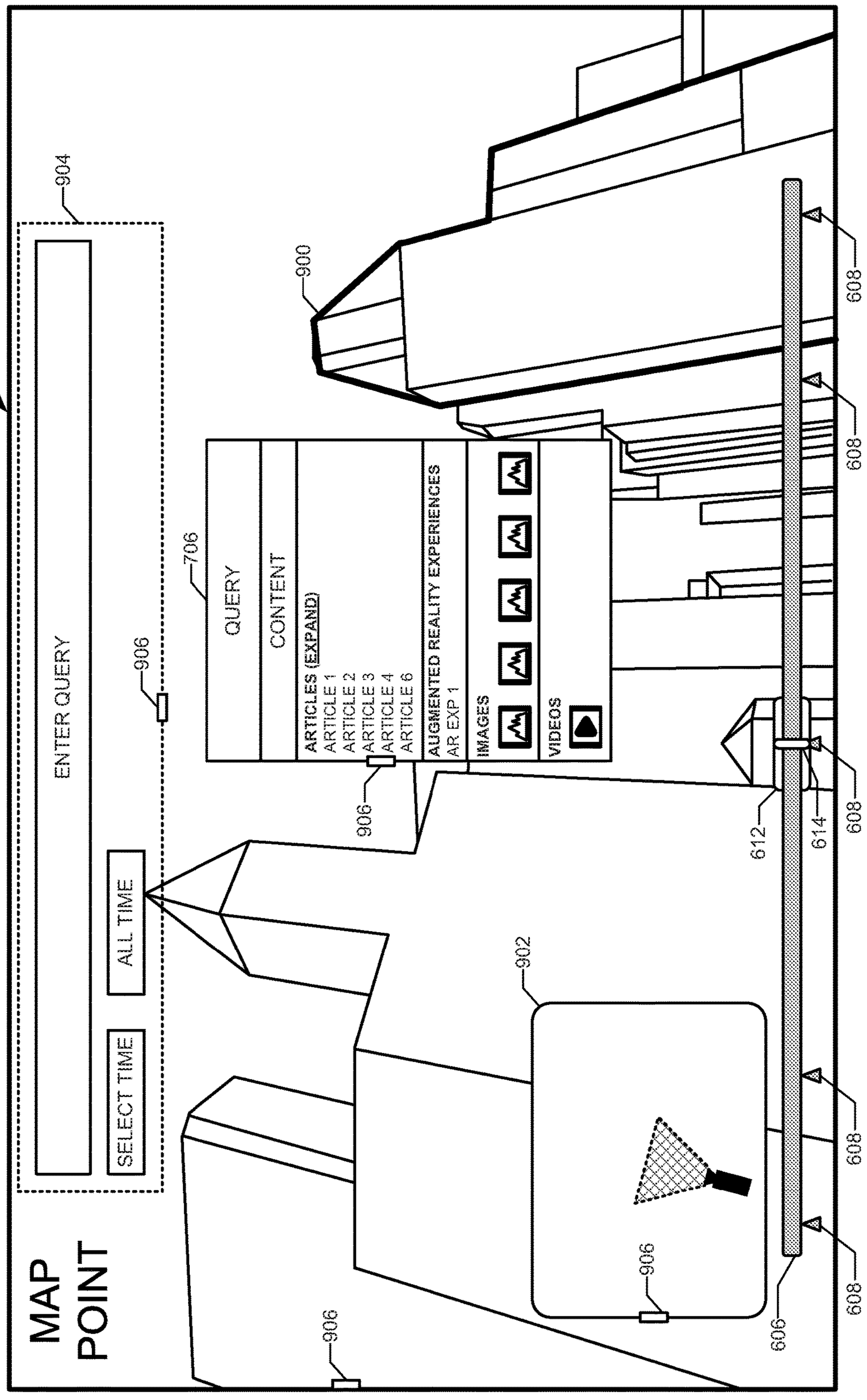
904
518
ENTER QUERY
ALL TIME
SELECT TIME
MAP POINT
900
608
706
QUERY
CONTENT
ARTICLES (EXPAND)
ARTICLE 1
ARTICLE 2
ARTICLE 3
ARTICLE 4
ARTICLE 6
AUGMENTED REALITY EXPERIENCES
AR EXP 1
IMAGES
VIDEOS
906
902
612
614

FIG. 9

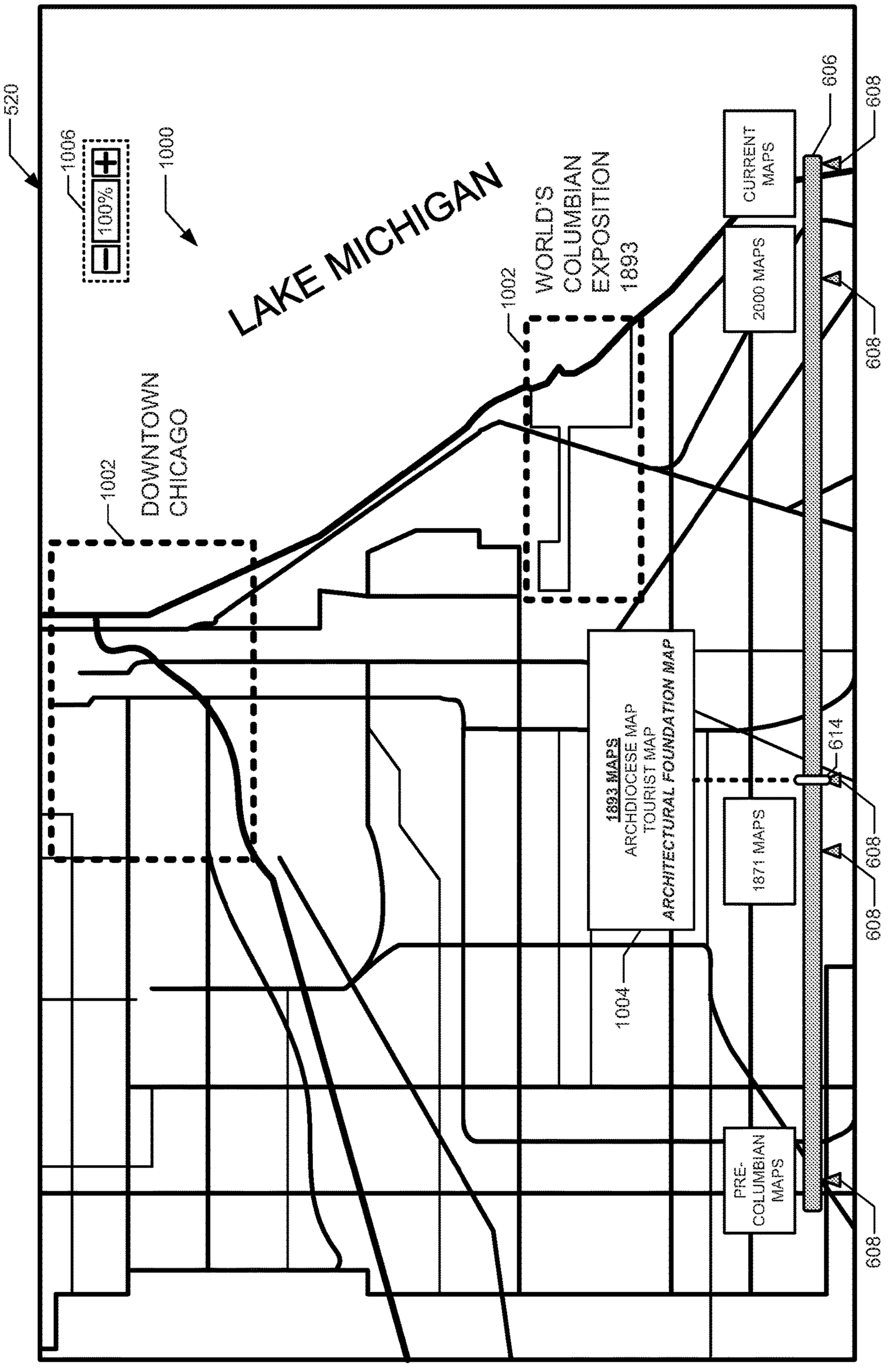
520
1006
100%
1000
LAKE MICHIGAN
1002
WORLD'S COLUMBIAN EXPOSITION 1893
1002
DOWNTOWN CHICAGO
606
608
CURRENT MAPS
2000 MAPS
608
1893 MAPS
ARCHDIOCESE MAP
TOURIST MAP
ARCHITECTURAL FOUNDATION MAP
614
1871 MAPS
608
1004
PRE-COLUMBIAN MAPS
608

FIG. 10

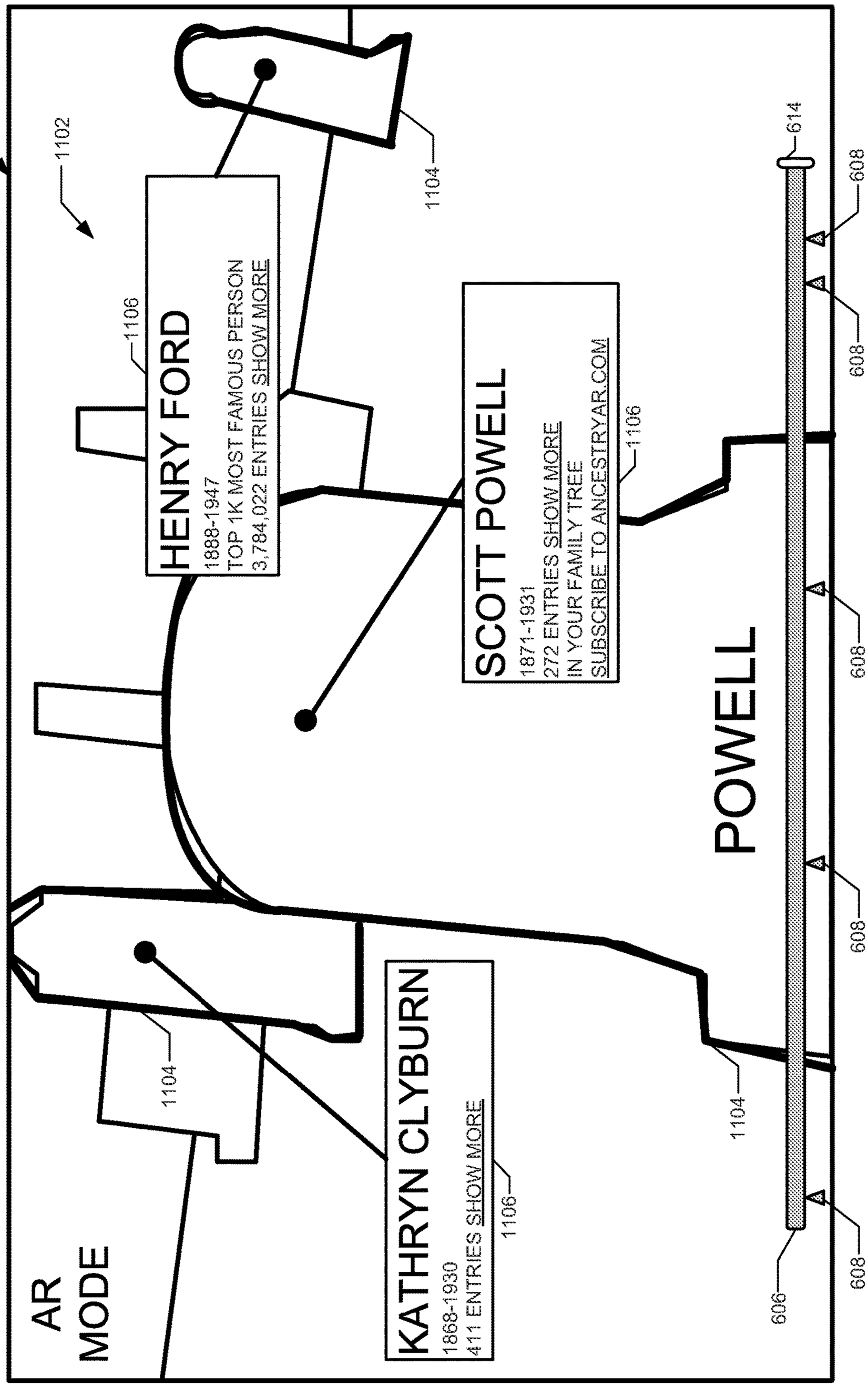
522
1102
1104
614
608
1106
HENRY FORD
1888-1947
TOP 1K MOST FAMOUS PERSON
3,784,022 ENTRIES SHOW MORE
SCOTT POWELL
1871-1931
272 ENTRIES SHOW MORE
IN YOUR FAMILY TREE
SUBSCRIBE TO ANCESTRYAR.COM
POWELL
AR
MODE
KATHRYN CLYBURN
1868-1930
411 ENTRIES SHOW MORE
606

FIG. 11

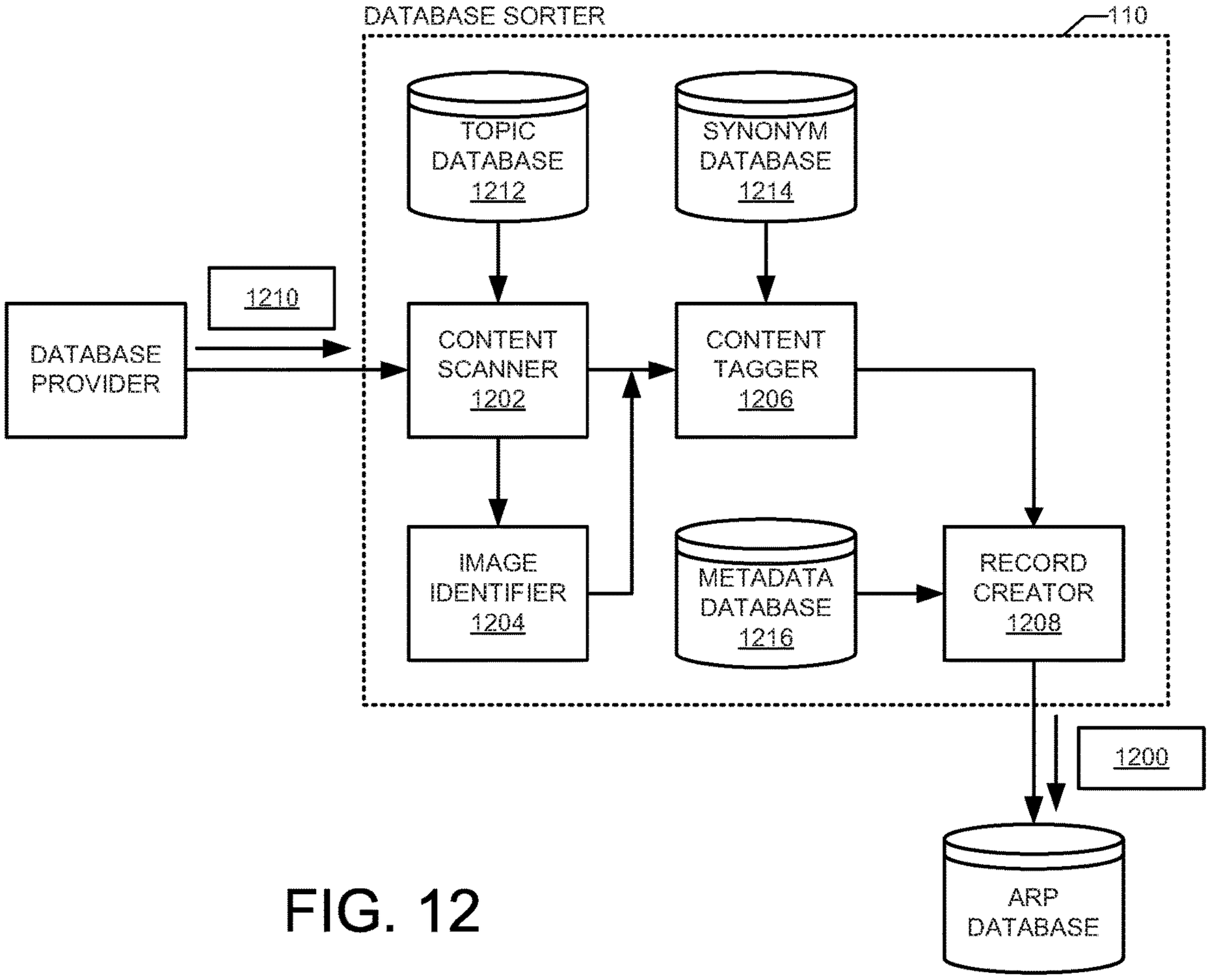
DATABASE SORTER
110
TOPIC DATABASE 1212
SYNONYM DATABASE 1214
1210
DATABASE PROVIDER
CONTENT SCANNER 1202
CONTENT TAGGER 1206
IMAGE IDENTIFIER 1204
METADATA DATABASE 1216
RECORD CREATOR 1208
1200
ARP DATABASE

FIG. 12

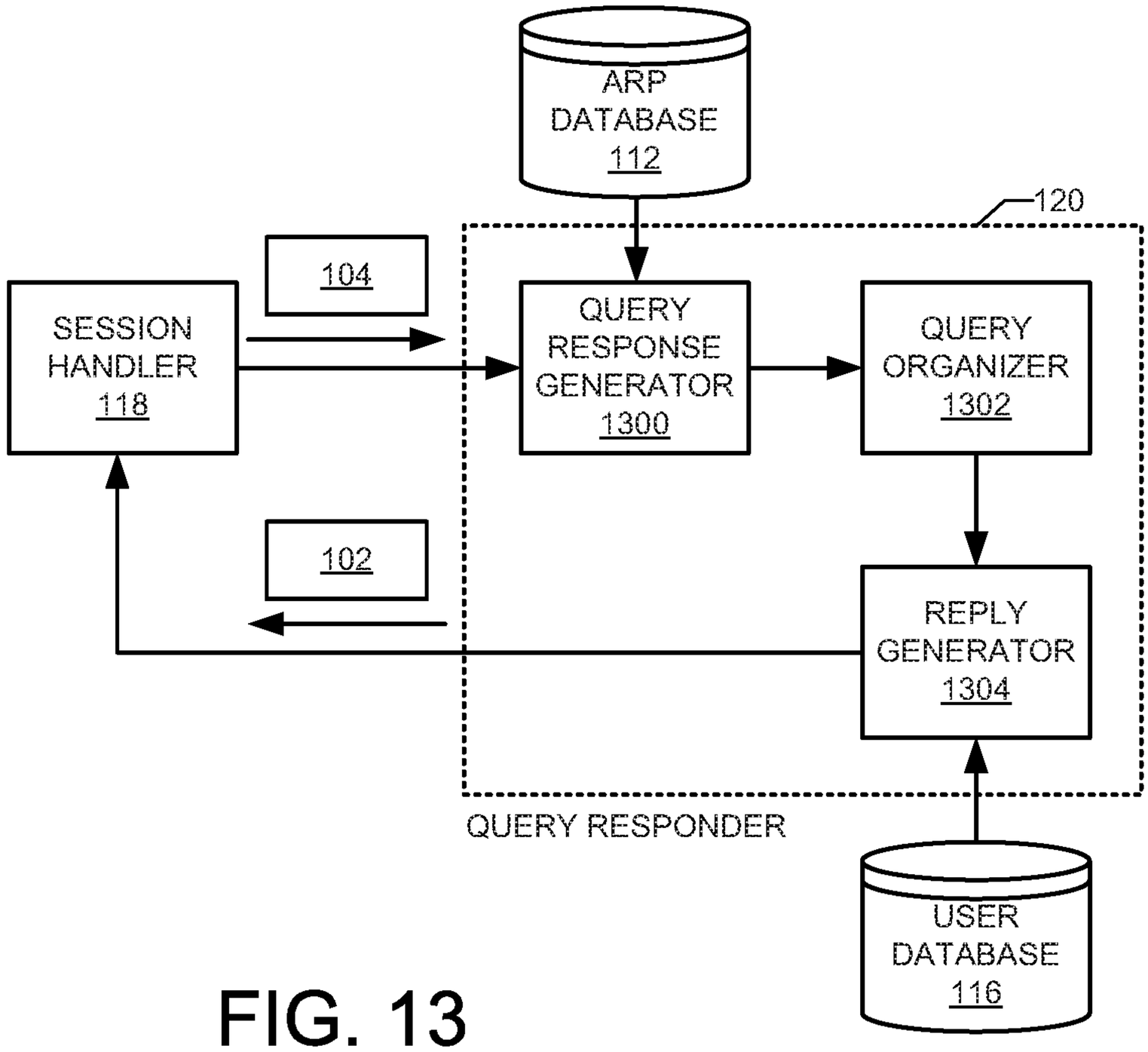
ARP
DATABASE
112
120
104
SESSION
HANDLER
118
QUERY
RESPONSE
GENERATOR
1300
QUERY
ORGANIZER
1302
102
REPLY
GENERATOR
1304
QUERY RESPONDER
USER
DATABASE
116

FIG. 13

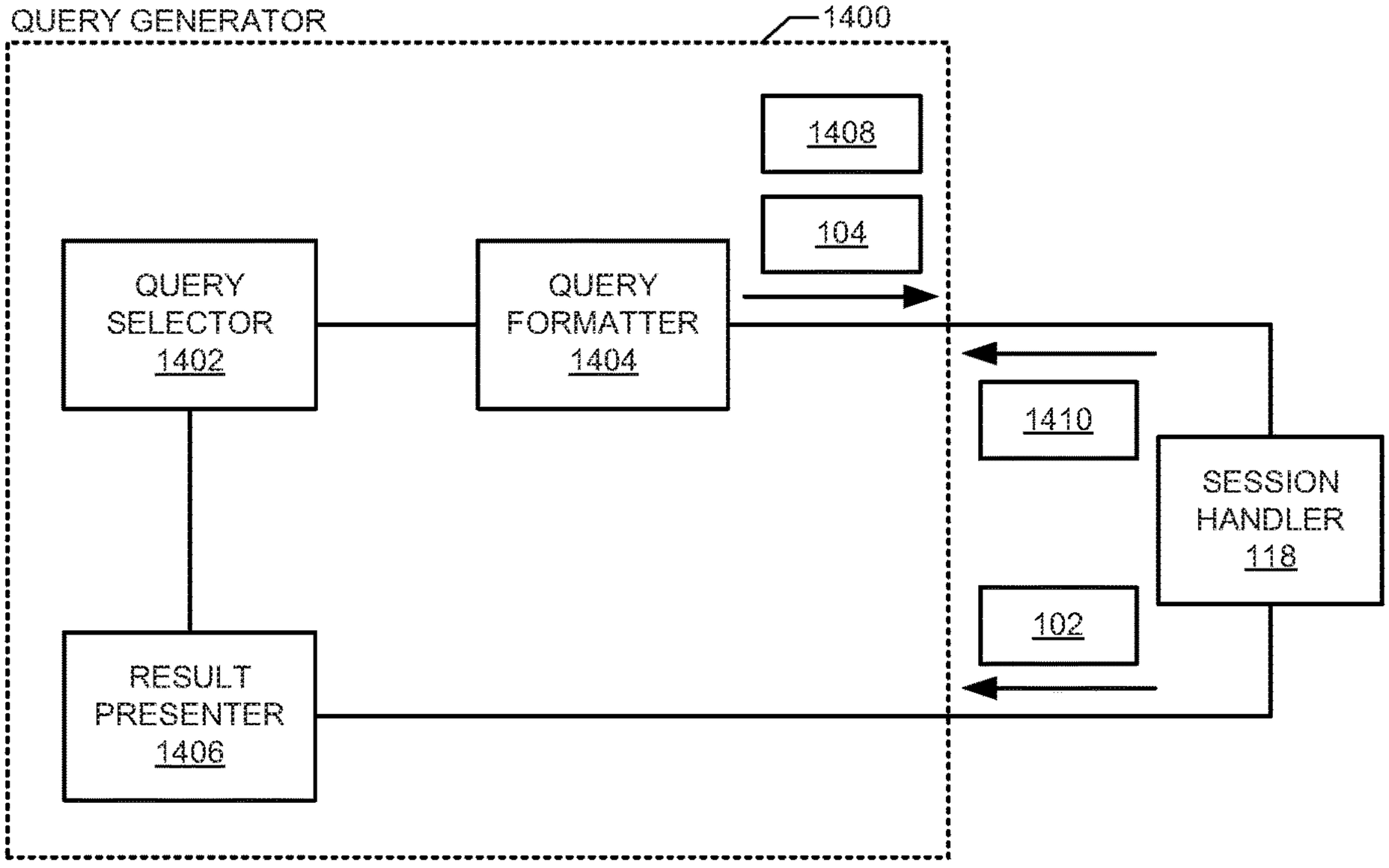
QUERY GENERATOR
1400
1408
104
QUERY SELECTOR 1402
QUERY FORMATTER 1404
1410
SESSION HANDLER 118
102
RESULT PRESENTER 1406

FIG. 14

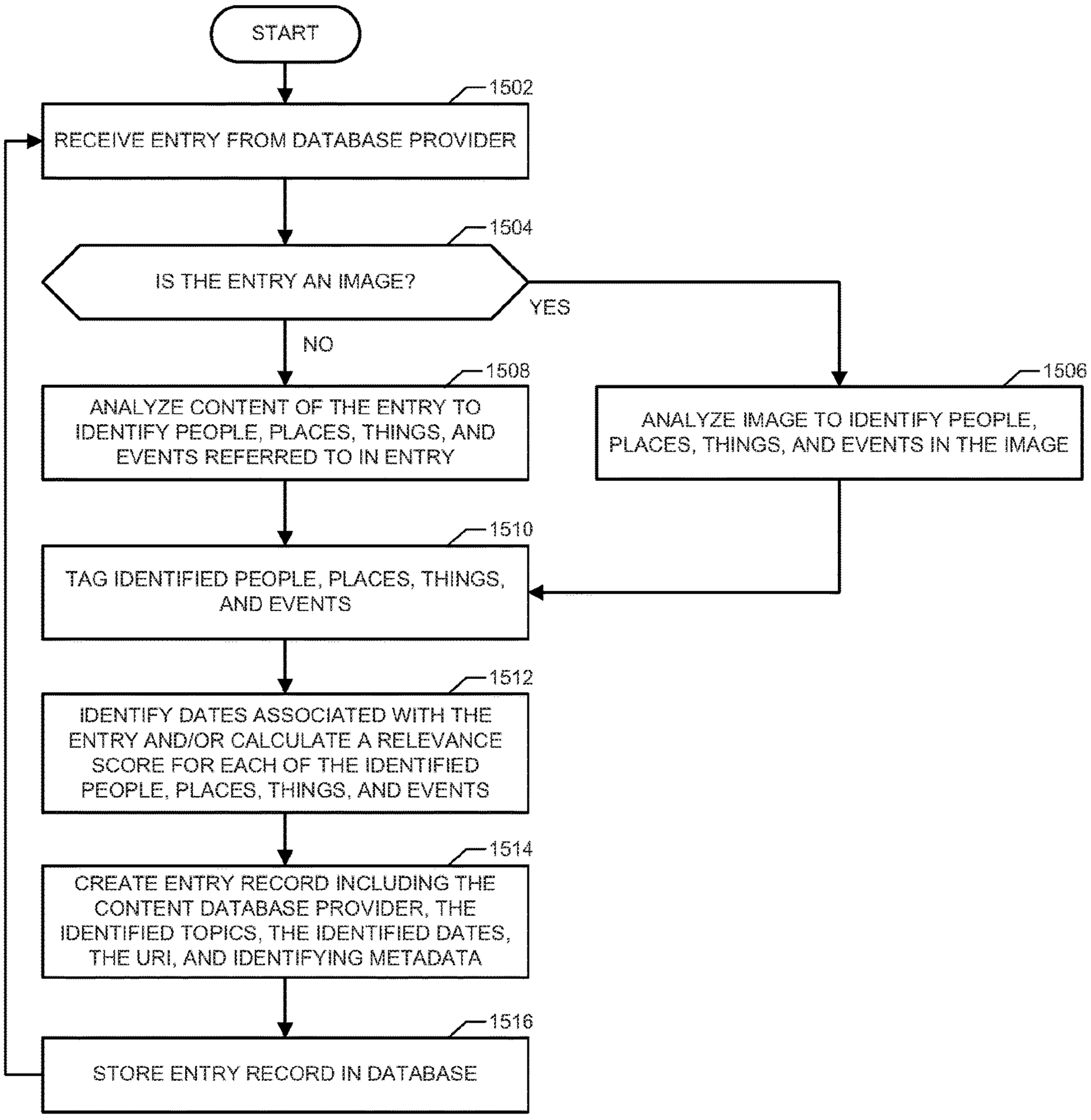
START
1502
RECEIVE ENTRY FROM DATABASE PROVIDER
1504
IS THE ENTRY AN IMAGE?
YES
NO
1508
ANALYZE CONTENT OF THE ENTRY TO IDENTIFY PEOPLE, PLACES, THINGS, AND EVENTS REFERRED TO IN ENTRY
1506
ANALYZE IMAGE TO IDENTIFY PEOPLE, PLACES, THINGS, AND EVENTS IN THE IMAGE
1510
TAG IDENTIFIED PEOPLE, PLACES, THINGS, AND EVENTS
1512
IDENTIFY DATES ASSOCIATED WITH THE ENTRY AND/OR CALCULATE A RELEVANCE SCORE FOR EACH OF THE IDENTIFIED PEOPLE, PLACES, THINGS, AND EVENTS
1514
CREATE ENTRY RECORD INCLUDING THE CONTENT DATABASE PROVIDER, THE IDENTIFIED TOPICS, THE IDENTIFIED DATES, THE URI, AND IDENTIFYING METADATA
1516
STORE ENTRY RECORD IN DATABASE

FIG. 15

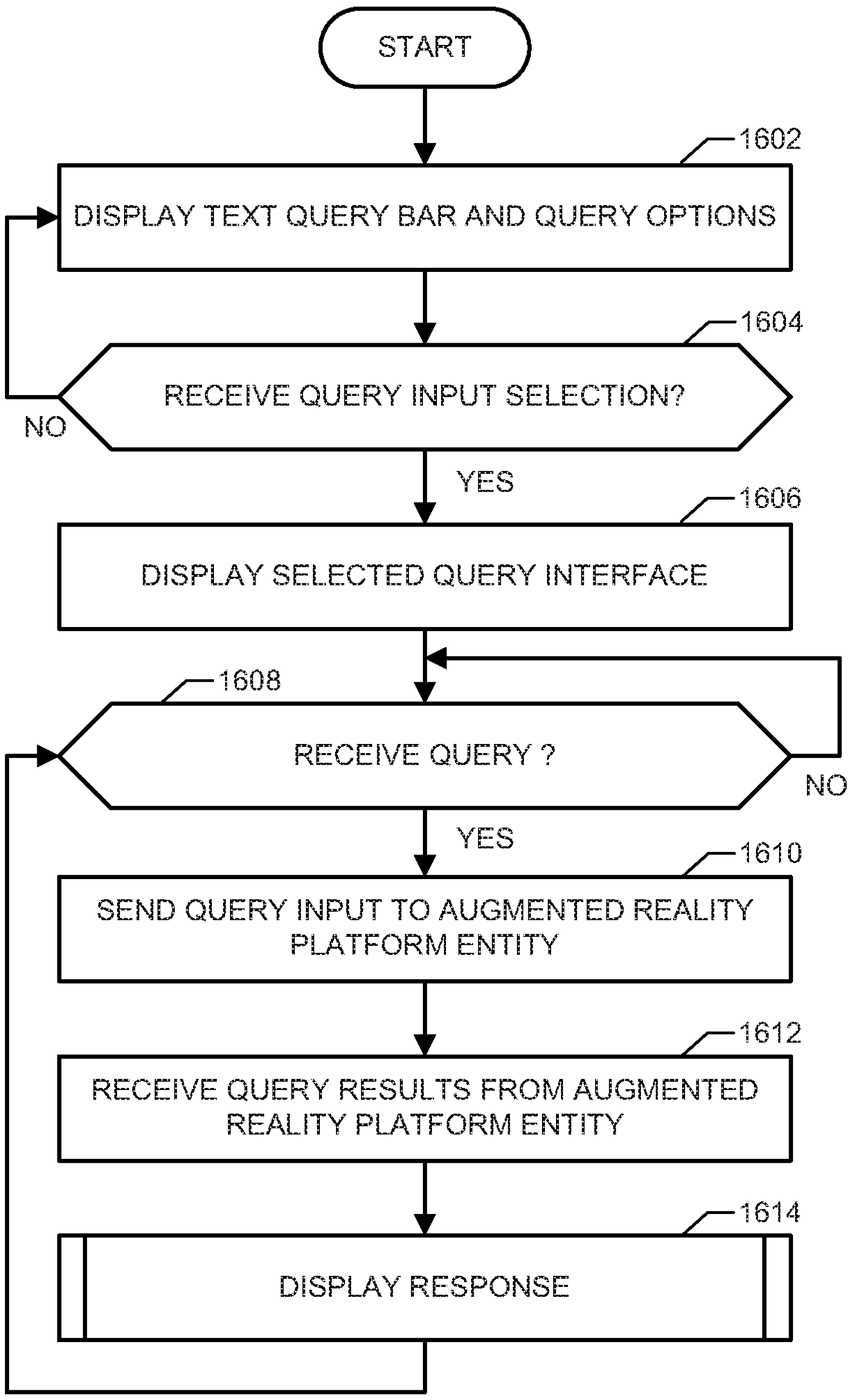
START
1602
DISPLAY TEXT QUERY BAR AND QUERY OPTIONS
1604
RECEIVE QUERY INPUT SELECTION?
NO
YES
1606
DISPLAY SELECTED QUERY INTERFACE
1608
RECEIVE QUERY ?
NO
YES
1610
SEND QUERY INPUT TO AUGMENTED REALITY PLATFORM ENTITY
1612
RECEIVE QUERY RESULTS FROM AUGMENTED REALITY PLATFORM ENTITY
1614
DISPLAY RESPONSE

FIG. 16

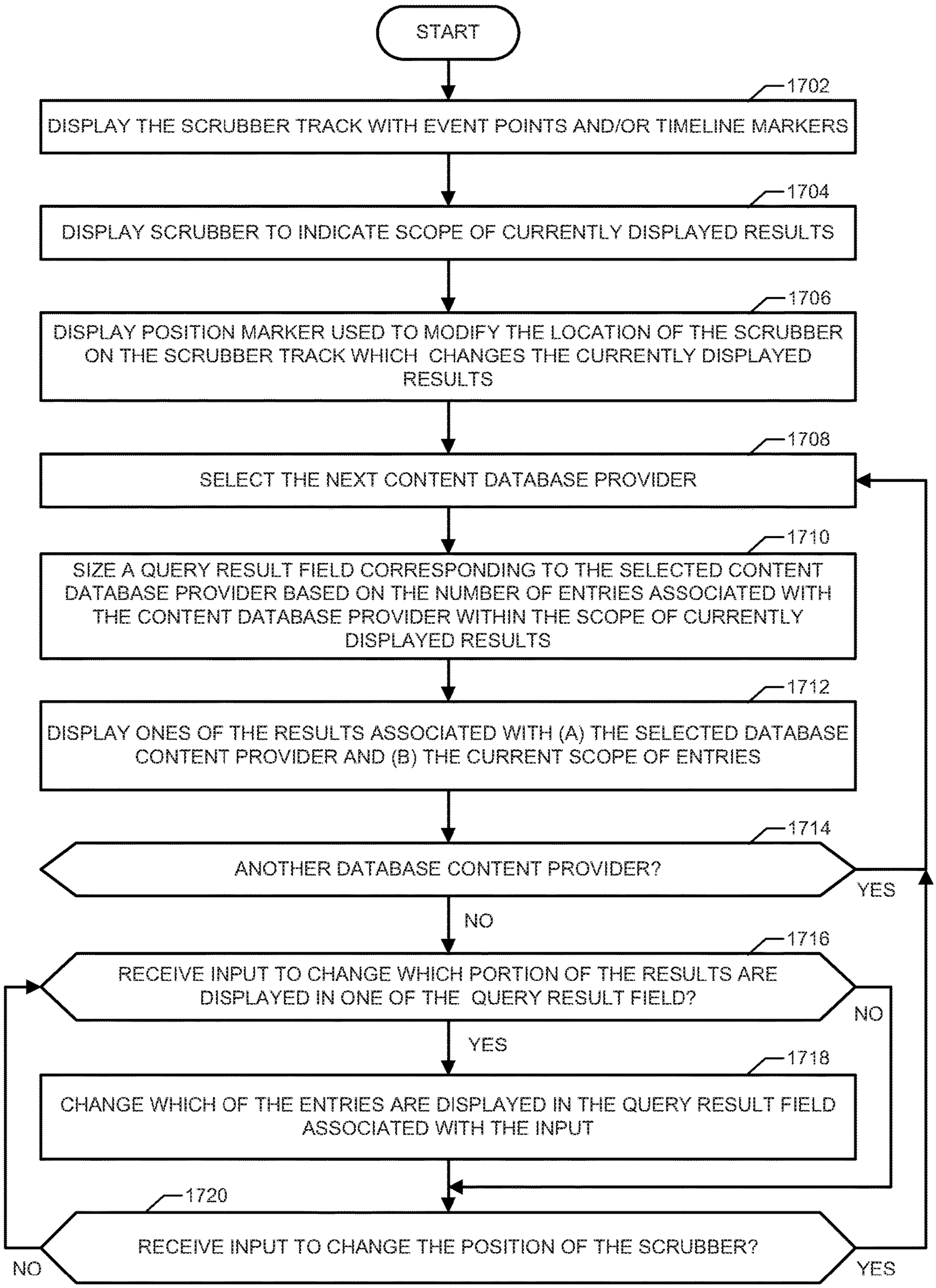
START
1702
DISPLAY THE SCRUBBER TRACK WITH EVENT POINTS AND/OR TIMELINE MARKERS
1704
DISPLAY SCRUBBER TO INDICATE SCOPE OF CURRENTLY DISPLAYED RESULTS
1706
DISPLAY POSITION MARKER USED TO MODIFY THE LOCATION OF THE SCRUBBER ON THE SCRUBBER TRACK WHICH CHANGES THE CURRENTLY DISPLAYED RESULTS
1708
SELECT THE NEXT CONTENT DATABASE PROVIDER
1710
SIZE A QUERY RESULT FIELD CORRESPONDING TO THE SELECTED CONTENT DATABASE PROVIDER BASED ON THE NUMBER OF ENTRIES ASSOCIATED WITH THE CONTENT DATABASE PROVIDER WITHIN THE SCOPE OF CURRENTLY DISPLAYED RESULTS
1712
DISPLAY ONES OF THE RESULTS ASSOCIATED WITH (A) THE SELECTED DATABASE CONTENT PROVIDER AND (B) THE CURRENT SCOPE OF ENTRIES
1714
ANOTHER DATABASE CONTENT PROVIDER?
YES
NO
1716
RECEIVE INPUT TO CHANGE WHICH PORTION OF THE RESULTS ARE DISPLAYED IN ONE OF THE QUERY RESULT FIELD?
NO
YES
1718
CHANGE WHICH OF THE ENTRIES ARE DISPLAYED IN THE QUERY RESULT FIELD ASSOCIATED WITH THE INPUT
1720
RECEIVE INPUT TO CHANGE THE POSITION OF THE SCRUBBER?
NO
YES

FIG. 17

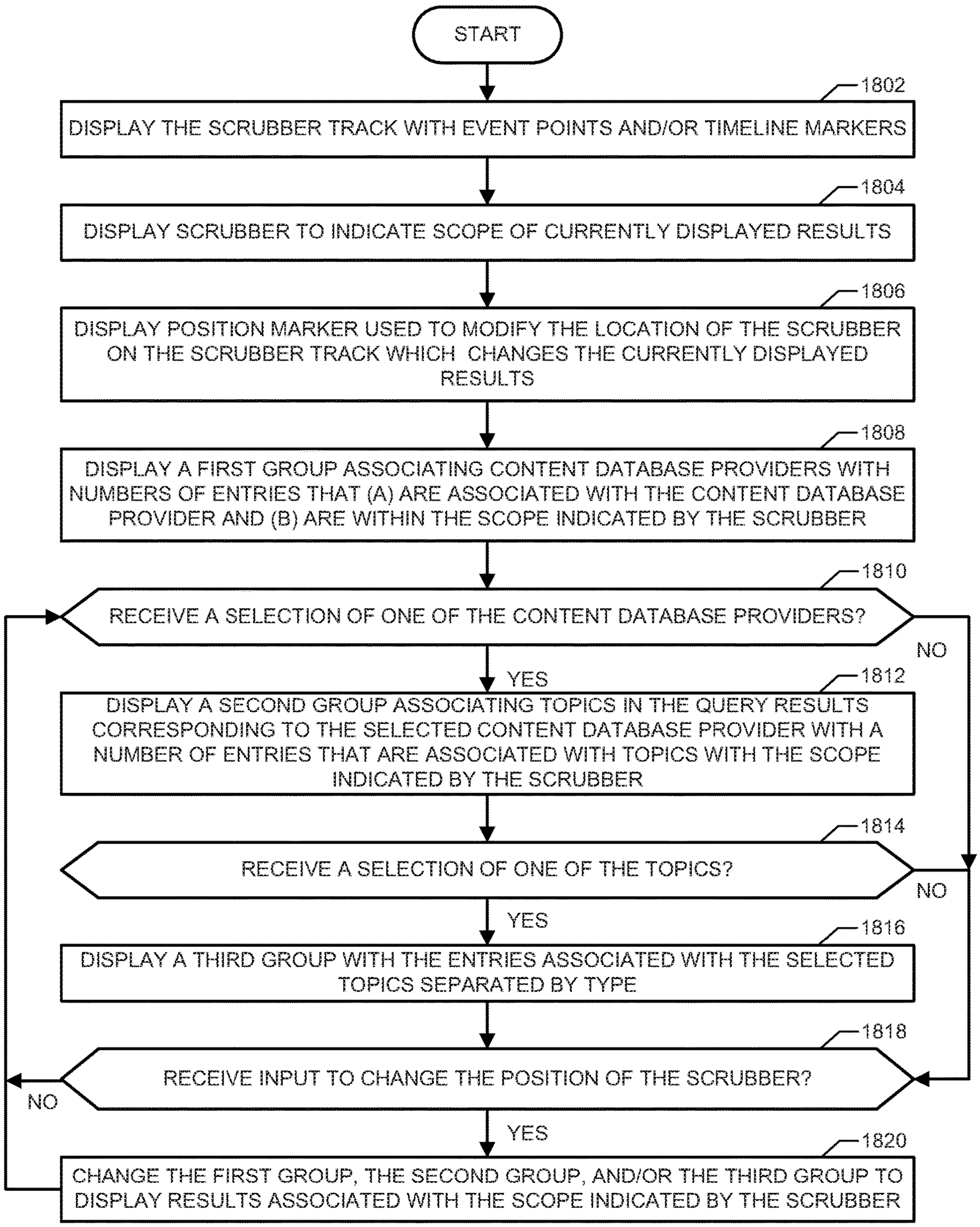
START
1802
DISPLAY THE SCRUBBER TRACK WITH EVENT POINTS AND/OR TIMELINE MARKERS
1804
DISPLAY SCRUBBER TO INDICATE SCOPE OF CURRENTLY DISPLAYED RESULTS
1806
DISPLAY POSITION MARKER USED TO MODIFY THE LOCATION OF THE SCRUBBER ON THE SCRUBBER TRACK WHICH CHANGES THE CURRENTLY DISPLAYED RESULTS
1808
DISPLAY A FIRST GROUP ASSOCIATING CONTENT DATABASE PROVIDERS WITH NUMBERS OF ENTRIES THAT (A) ARE ASSOCIATED WITH THE CONTENT DATABASE PROVIDER AND (B) ARE WITHIN THE SCOPE INDICATED BY THE SCRUBBER
1810
RECEIVE A SELECTION OF ONE OF THE CONTENT DATABASE PROVIDERS?
NO
YES
1812
DISPLAY A SECOND GROUP ASSOCIATING TOPICS IN THE QUERY RESULTS CORRESPONDING TO THE SELECTED CONTENT DATABASE PROVIDER WITH A NUMBER OF ENTRIES THAT ARE ASSOCIATED WITH TOPICS WITH THE SCOPE INDICATED BY THE SCRUBBER
1814
RECEIVE A SELECTION OF ONE OF THE TOPICS?
NO
YES
1816
DISPLAY A THIRD GROUP WITH THE ENTRIES ASSOCIATED WITH THE SELECTED TOPICS SEPARATED BY TYPE
1818
RECEIVE INPUT TO CHANGE THE POSITION OF THE SCRUBBER?
NO
YES
1820
CHANGE THE FIRST GROUP, THE SECOND GROUP, AND/OR THE THIRD GROUP TO DISPLAY RESULTS ASSOCIATED WITH THE SCOPE INDICATED BY THE SCRUBBER

FIG. 18

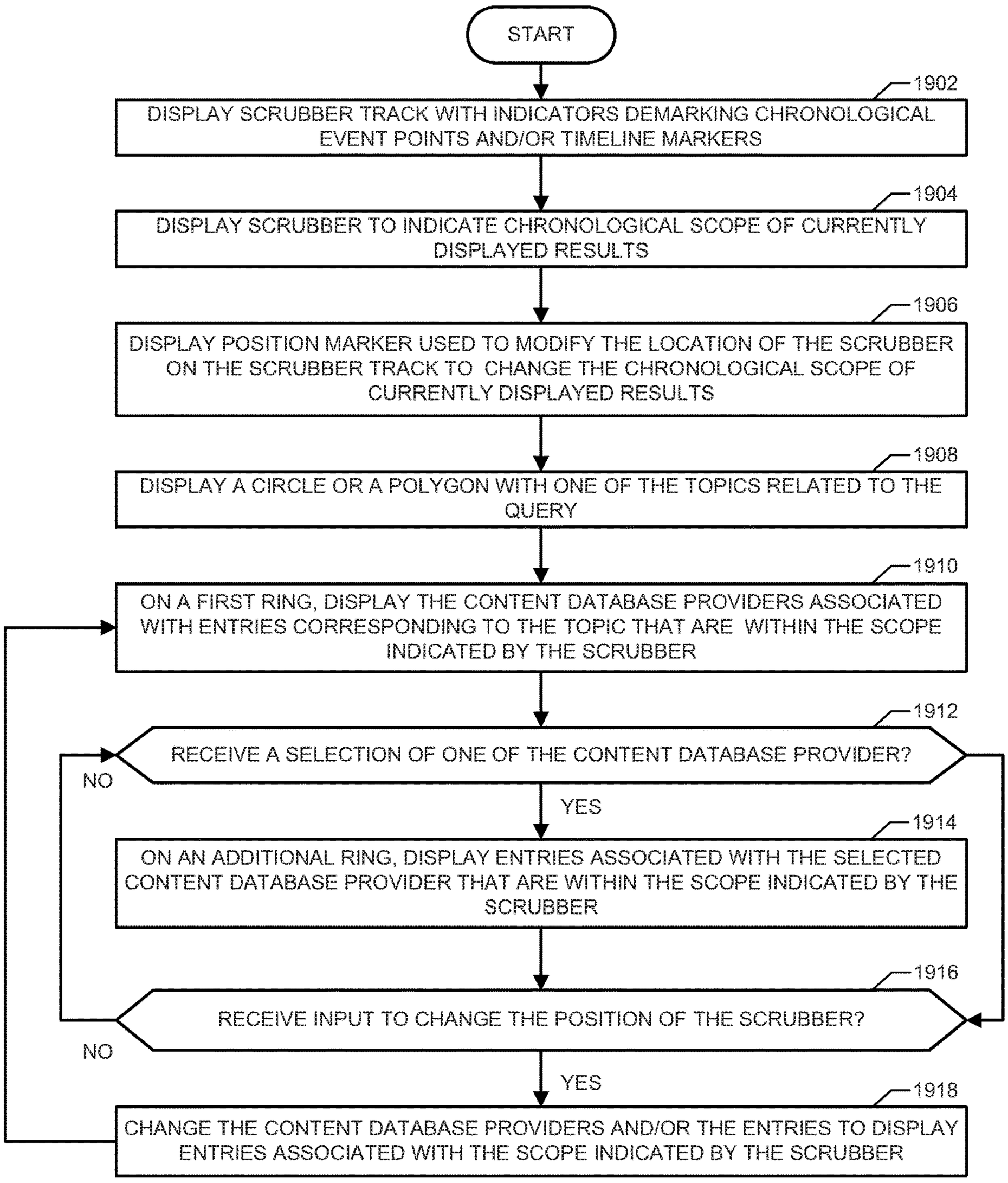
START
1902
DISPLAY SCRUBBER TRACK WITH INDICATORS DEMARKING CHRONOLOGICAL EVENT POINTS AND/OR TIMELINE MARKERS
1904
DISPLAY SCRUBBER TO INDICATE CHRONOLOGICAL SCOPE OF CURRENTLY DISPLAYED RESULTS
1906
DISPLAY POSITION MARKER USED TO MODIFY THE LOCATION OF THE SCRUBBER ON THE SCRUBBER TRACK TO CHANGE THE CHRONOLOGICAL SCOPE OF CURRENTLY DISPLAYED RESULTS
1908
DISPLAY A CIRCLE OR A POLYGON WITH ONE OF THE TOPICS RELATED TO THE QUERY
1910
ON A FIRST RING, DISPLAY THE CONTENT DATABASE PROVIDERS ASSOCIATED WITH ENTRIES CORRESPONDING TO THE TOPIC THAT ARE WITHIN THE SCOPE INDICATED BY THE SCRUBBER
1912
RECEIVE A SELECTION OF ONE OF THE CONTENT DATABASE PROVIDER?
NO
YES
1914
ON AN ADDITIONAL RING, DISPLAY ENTRIES ASSOCIATED WITH THE SELECTED CONTENT DATABASE PROVIDER THAT ARE WITHIN THE SCOPE INDICATED BY THE SCRUBBER
1916
RECEIVE INPUT TO CHANGE THE POSITION OF THE SCRUBBER?
NO
YES
1918
CHANGE THE CONTENT DATABASE PROVIDERS AND/OR THE ENTRIES TO DISPLAY ENTRIES ASSOCIATED WITH THE SCOPE INDICATED BY THE SCRUBBER

FIG. 19

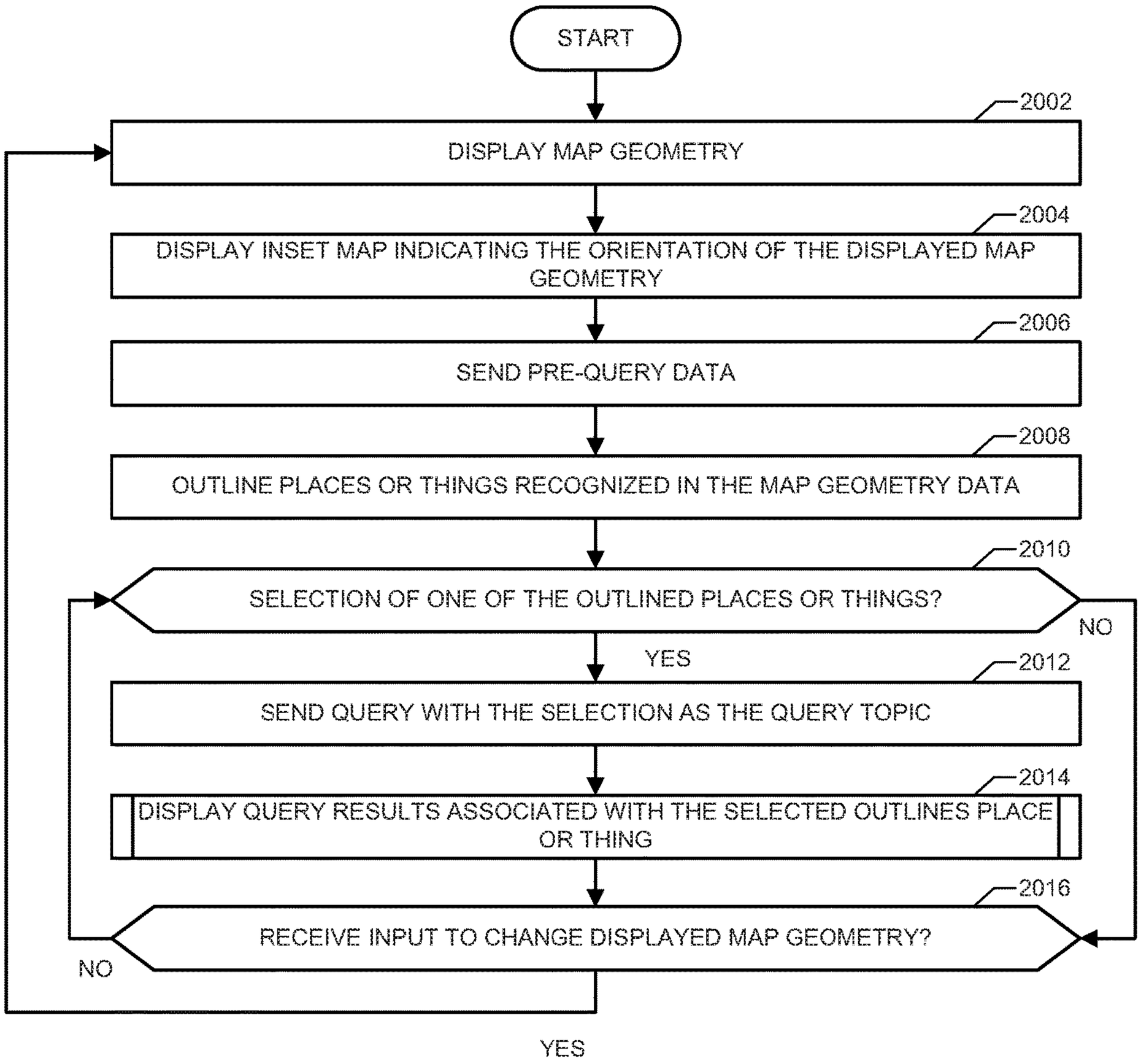
START
2002
DISPLAY MAP GEOMETRY
2004
DISPLAY INSET MAP INDICATING THE ORIENTATION OF THE DISPLAYED MAP GEOMETRY
2006
SEND PRE-QUERY DATA
2008
OUTLINE PLACES OR THINGS RECOGNIZED IN THE MAP GEOMETRY DATA
2010
SELECTION OF ONE OF THE OUTLINED PLACES OR THINGS?
NO
YES
2012
SEND QUERY WITH THE SELECTION AS THE QUERY TOPIC
2014
DISPLAY QUERY RESULTS ASSOCIATED WITH THE SELECTED OUTLINES PLACE OR THING
2016
RECEIVE INPUT TO CHANGE DISPLAYED MAP GEOMETRY?
NO
YES

FIG. 20

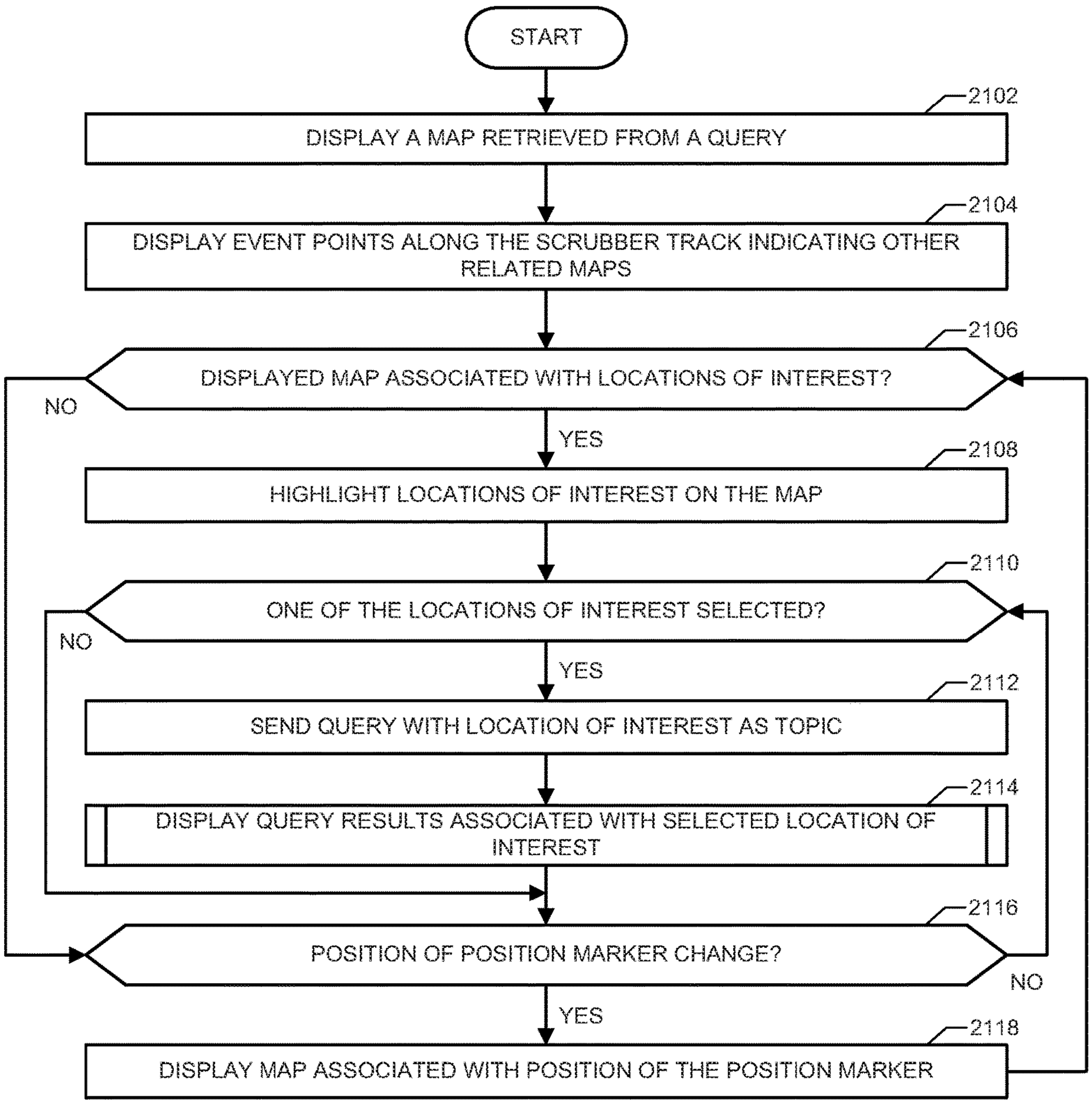
START
2102
DISPLAY A MAP RETRIEVED FROM A QUERY
2104
DISPLAY EVENT POINTS ALONG THE SCRUBBER TRACK INDICATING OTHER RELATED MAPS
2106
DISPLAYED MAP ASSOCIATED WITH LOCATIONS OF INTEREST?
NO
YES
2108
HIGHLIGHT LOCATIONS OF INTEREST ON THE MAP
2110
ONE OF THE LOCATIONS OF INTEREST SELECTED?
NO
YES
2112
SEND QUERY WITH LOCATION OF INTEREST AS TOPIC
2114
DISPLAY QUERY RESULTS ASSOCIATED WITH SELECTED LOCATION OF INTEREST
2116
POSITION OF POSITION MARKER CHANGE?
NO
YES
2118
DISPLAY MAP ASSOCIATED WITH POSITION OF THE POSITION MARKER

FIG. 21

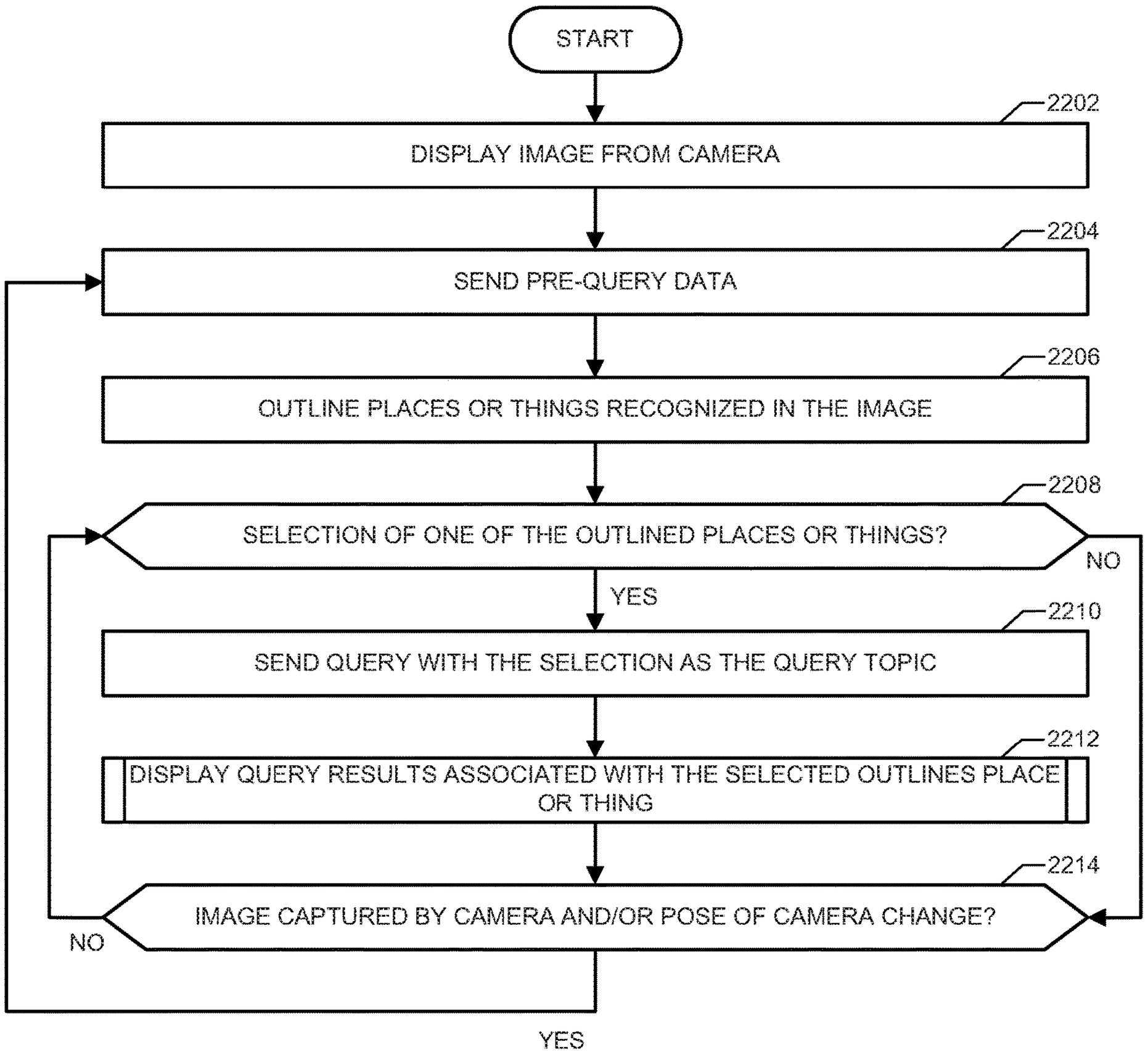
START
2202
DISPLAY IMAGE FROM CAMERA
2204
SEND PRE-QUERY DATA
2206
OUTLINE PLACES OR THINGS RECOGNIZED IN THE IMAGE
2208
SELECTION OF ONE OF THE OUTLINED PLACES OR THINGS?
NO
YES
2210
SEND QUERY WITH THE SELECTION AS THE QUERY TOPIC
2212
DISPLAY QUERY RESULTS ASSOCIATED WITH THE SELECTED OUTLINES PLACE OR THING
2214
IMAGE CAPTURED BY CAMERA AND/OR POSE OF CAMERA CHANGE?
NO
YES

FIG. 22

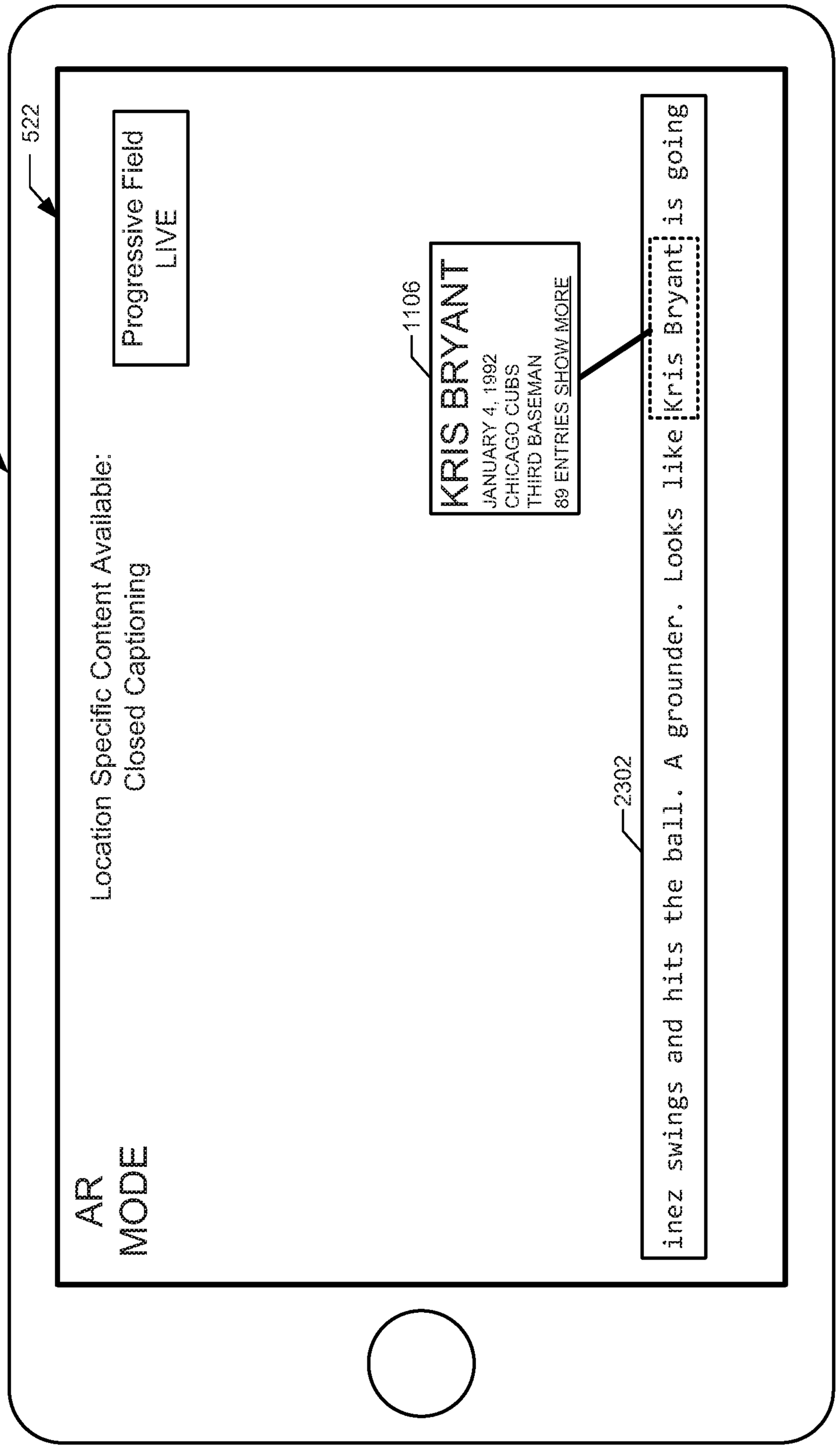
106
522
Progressive Field
LIVE
Location Specific Content Available:
Closed Captioning
AR
MODE
1106
KRIS BRYANT
JANUARY 4, 1992
CHICAGO CUBS
THIRD BASEMAN
89 ENTRIES SHOW MORE
2302
hits the ball. A grounder. Looks like Kris Bryant is going
inez swings and hi

FIG. 23

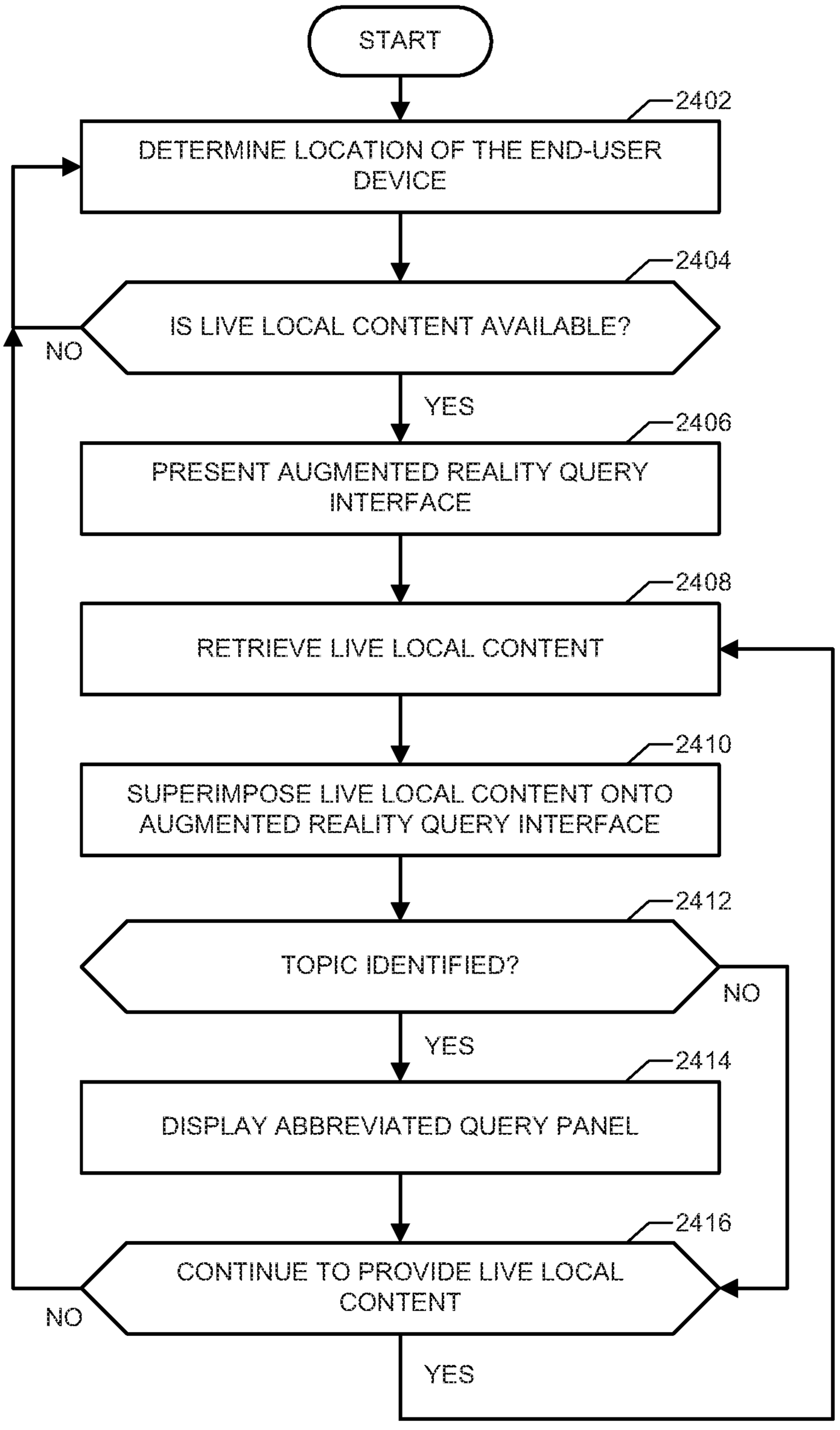
START
2402
DETERMINE LOCATION OF THE END-USER DEVICE
2404
IS LIVE LOCAL CONTENT AVAILABLE?
NO
YES
2406
PRESENT AUGMENTED REALITY QUERY INTERFACE
2408
RETRIEVE LIVE LOCAL CONTENT
2410
SUPERIMPOSE LIVE LOCAL CONTENT ONTO AUGMENTED REALITY QUERY INTERFACE
2412
TOPIC IDENTIFIED?
NO
YES
2414
DISPLAY ABBREVIATED QUERY PANEL
2416
CONTINUE TO PROVIDE LIVE LOCAL CONTENT
NO
YES

FIG. 24

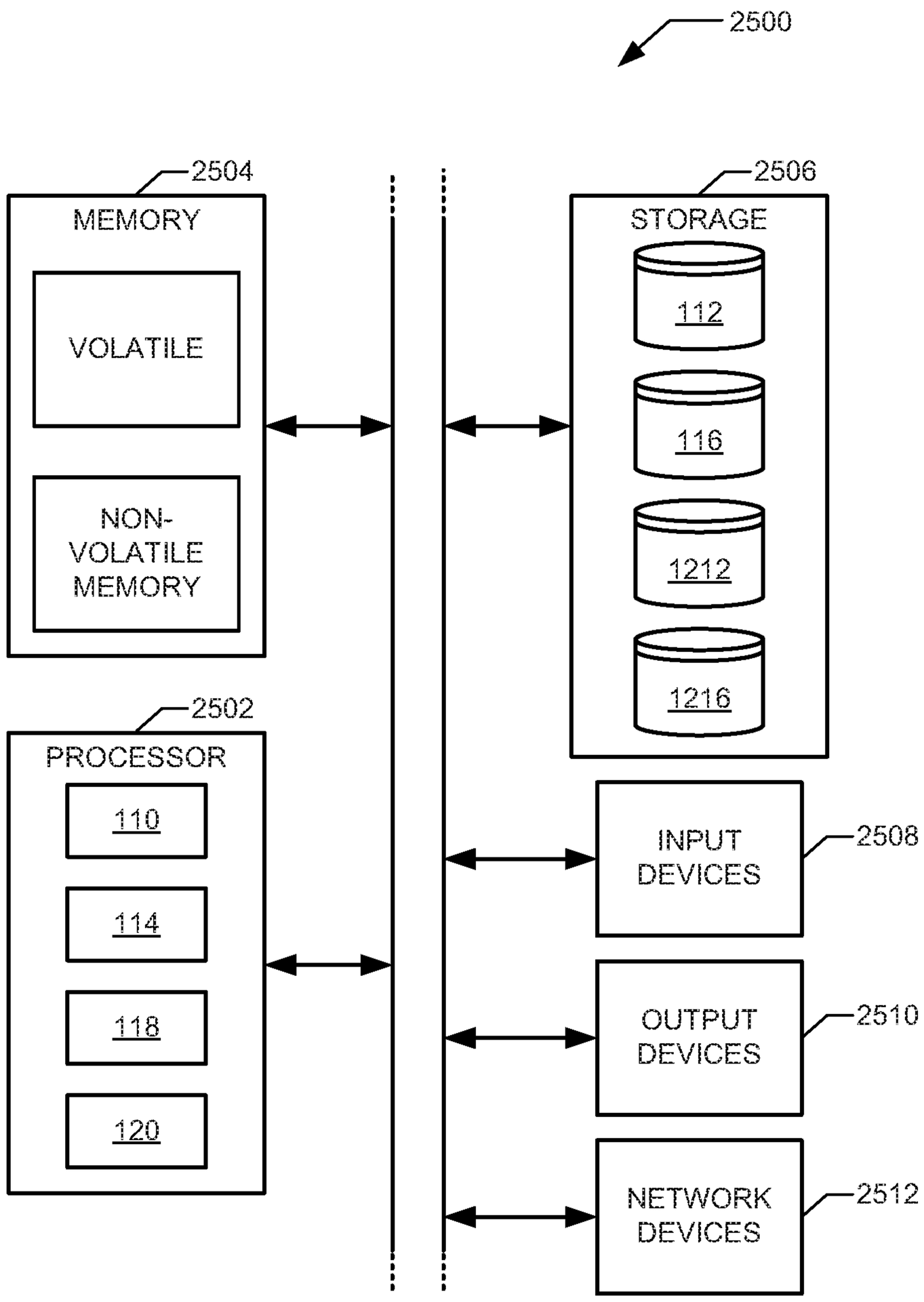
2500
2504
MEMORY
VOLATILE
NON-VOLATILE MEMORY
2506
STORAGE
112
116
1212
1216
2502
PROCESSOR
110
114
118
120
INPUT DEVICES
2508
OUTPUT DEVICES
2510
NETWORK DEVICES
2512

FIG. 25

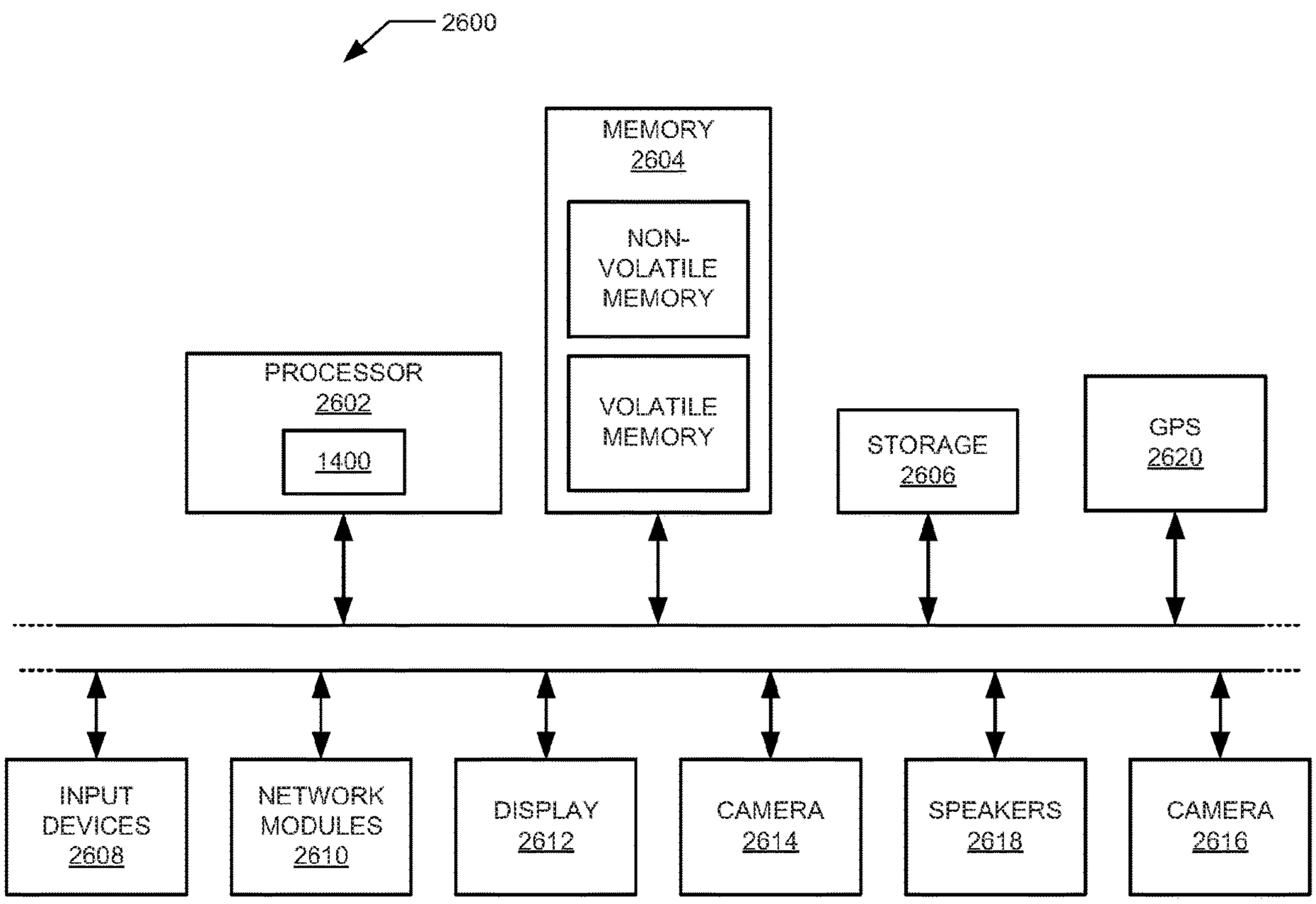
2600
MEMORY
2604
NON-
VOLATILE
MEMORY
VOLATILE
MEMORY
PROCESSOR
2602
1400
STORAGE
2606
GPS
2620
INPUT
DEVICES
2608
NETWORK
MODULES
2610
DISPLAY
2612
CAMERA
2614
SPEAKERS
2618
CAMERA
2616

FIG. 26

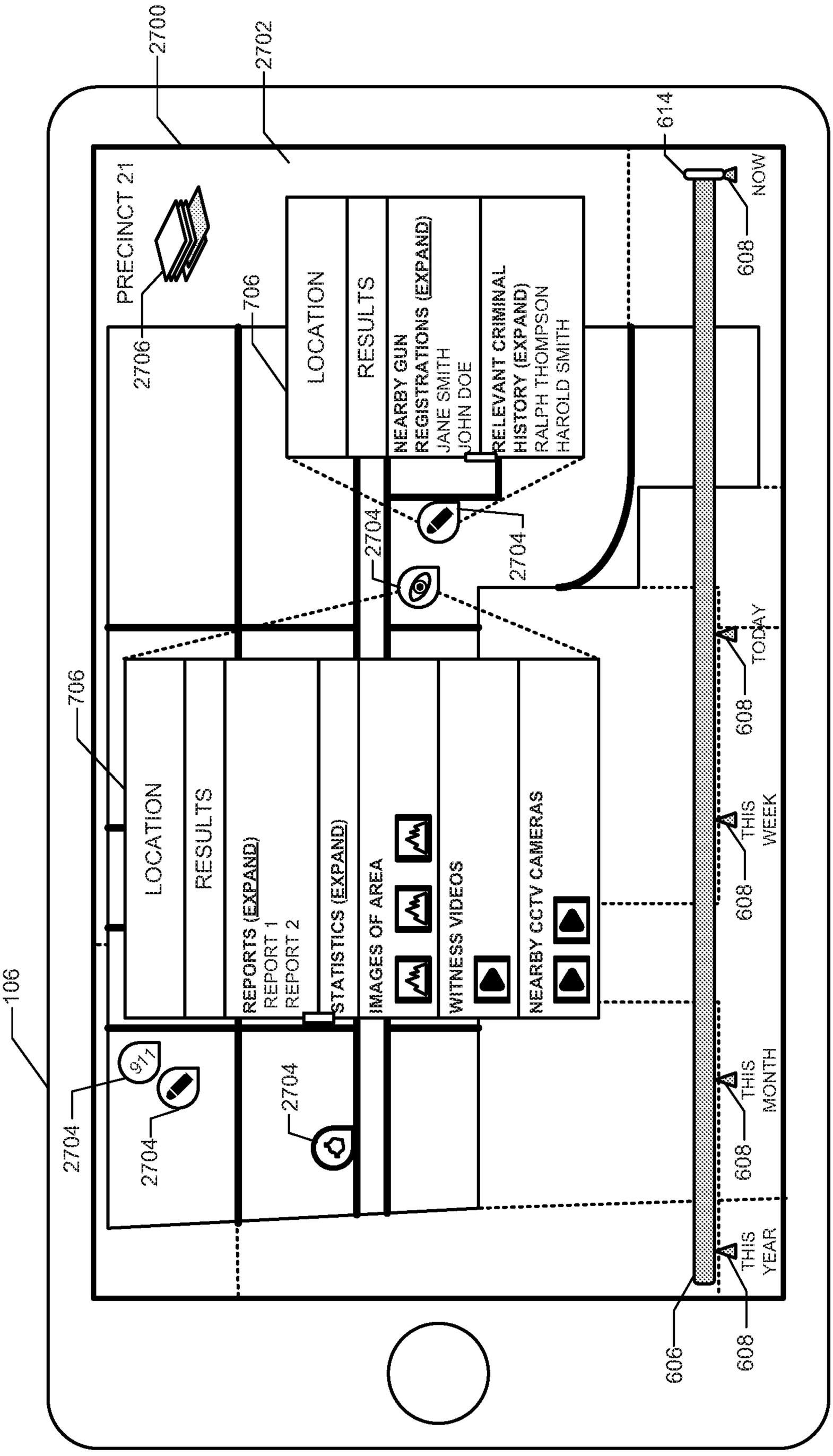
2700
2702
614
PRECINCT 21
706
LOCATION
RESULTS
REPORTS (EXPAND)
REPORT 1
REPORT 2
STATISTICS (EXPAND)
IMAGES OF AREA
WITNESS VIDEOS
NEARBY CCTV CAMERAS
NEARBY GUN REGISTRATIONS
JANE SMITH
JOHN DOE
RELEVANT CRIMINAL HISTORY (EXPAND)
RALPH THOMPSON
HAROLD SMITH
2706
2704
608
NOW
TODAY
THIS WEEK
THIS MONTH
THIS YEAR
606
911
106

FIG. 27

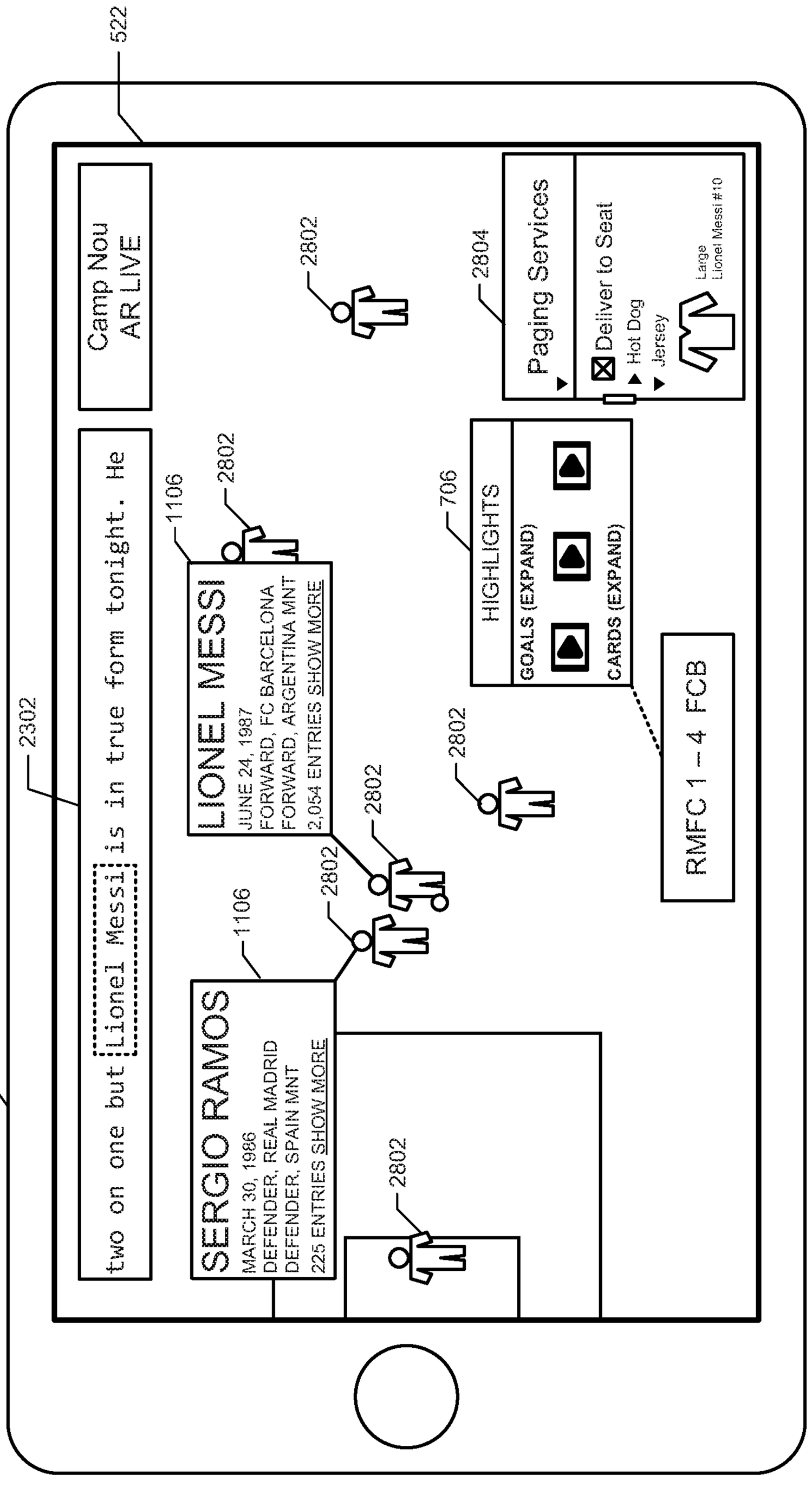
522
Camp Nou
AR LIVE
2802
2804
Paging Services
Deliver to Seat
Hot Dog
Jersey
Large
Lionel Messi #10
2302
Lionel Messi is in true form tonight. He
two on one but
1106
LIONEL MESSI
JUNE 24, 1987
FORWARD, FC BARCELONA
FORWARD, ARGENTINA MNT
2,054 ENTRIES SHOW MORE
706
HIGHLIGHTS
GOALS (EXPAND)
CARDS (EXPAND)
RMFC 1 – 4 FCB
SERGIO RAMOS
MARCH 30, 1986
DEFENDER, REAL MADRID
DEFENDER, SPAIN MNT
225 ENTRIES SHOW MORE
106

FIG. 28

SYSTEMS AND METHODS FOR A CHRONOLOGICAL-BASED SEARCH ENGINE

RELATED APPLICATIONS

This application is a U.S. National Stage Entry of International Application No. PCT/US2017/064749 filed Dec. 5, 2017, which claims the benefit of U.S. Provisional Application No. 62/430,584, filed Dec. 6, 2016 and U.S. Provisional Application No. 62/556,916, filed Sep. 11, 2017, each of which are incorporated by reference in their entirety.

TECHNICAL FIELD

The present disclosure generally relates to configuring computing devices to provide, organize, and present search engine results and, more specifically, systems and methods for a chronological-based search engine.

BACKGROUND

Search engines index content (e.g., text, images, videos, etc.) stored in databases and/or at network addresses (such as websites on the World Wide Web.). The indexing process parses and stores metadata associated with the content along with a location (sometimes referred to as a Uniform Resource Identifier (URI)) at which to retrieve the content. Search engines provide an interface to facilitate users searching for content of interest by entering words or phrases into a search box. The search engine searches the metadata generated for the index content to determine which one(s) of the index content is/are relevant to the entered words or phrases. The search engine provides the user with the URI of the relevant content. Often, the URI are presented to the used based on a relevancy score generated while the search engine searches the metadata.

SUMMARY

The appended claims define this application. The present disclosure summarizes aspects of the embodiments and should not be used to limit the claims. Other implementations are contemplated in accordance with the techniques described herein, as will be apparent to one having ordinary skill in the art upon examination of the following drawings and detailed description, and these implementations are intended to be within the scope of this application.

An example method includes generating records for entries from a plurality of database content providers, the records identifying topics included in the entries and dates associated with the entries. The example method also includes analyzing the entries from the plurality of database content providers to determine affinities between the topics. In response to receiving a query that includes a search topic from an end-user device, the example method includes (a) retrieving, from a database, records identifying the search topic and related topics that have affinity with the search topic, (b) organizing the records into chronological categories based on the dates associated with the corresponding entries, each one of the chronological categories representing a different period of time, (c) for each of the chronological categories, generating a query result with the processor, the query result organizing the records into hierarchies based on attributes of the entries associated with the records, and (d) sending the query result to the end-user device.

An example method includes presenting, on a display of an end-user device, a first map associated with a first topic included in a query sent to an augmented reality platform entity. The example method also includes highlighting areas of interest on the first map. The areas of interest associated are associated with second topics. Additionally, the example method includes presenting a scrubber track, a scrubber, and a plurality of event points. The event points indicate second maps related to the first topic. The second maps are associated with different dates than the first map. In response to receiving, with an input device, a selection of one of the areas of interest, the example method includes sending a query to the augmented reality platform entity that includes the corresponding second topic.

An example method includes presenting, on a display of an end-user device, map geometry data. The example method also includes highlighting objects of interest in the displayed map geometry data. The objects of interest are each associated with a topic. In response to receiving, with an input device, a selection of one of the objects of interest, the example method includes sending a query to an augmented reality platform entity that includes the corresponding topic. Additionally, in response to receiving a query result from the augmented reality platform entity, the method includes (a) presenting a scrubber track, a scrubber, and a plurality of event points, and (b) displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points. The plurality of event points each indicate a chronological category associated with the query result.

An example method includes presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device. The example method also includes highlighting objects of interest in the displayed live image data being captured by the camera. The objects of interest are each associated with a topic. In response to receiving, with an input device, a selection of one of the objects of interest, the example method includes sending a query to the augmented reality platform entity that includes the corresponding topic. Additionally, in response to receiving a query result from the augmented reality platform entity, the method includes (a) presenting a scrubber track, a scrubber, and a plurality of event points, and (b) displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points. The plurality of event points each indicate a chronological category associated with the query result.

An example method includes presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device. The example method also includes determining a pose of the end-user device. The pose includes a location of the end-user device. Additionally, the example method includes sending the pose of the end-user device to an augmented reality platform entity. The example method includes receiving closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device. The close caption data includes indications of first topics within the closed captioning data. The method of claim **1** includes superimposing the closed captioning data onto the live image data.

In one embodiment of the present application, a method includes the steps of presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device, determining a pose of the end-user device, the pose including a location of the end-user device, sending the pose of the end-user device to an augmented reality platform entity, receiving closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including an indication of a first topic embedded within the closed captioning data, and superimposing the closed captioning data incorporating an interactive element associated with the first topic onto the live image data.

In some embodiments, the method includes the step of highlighting objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic. In other embodiments, the step of highlighting the objects of interest in the displayed live image data being captured by the camera includes the steps of sending the pose of the end-user device to an augmented reality platform entity, the pose including the location and orientation of the end-user device, and receiving the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In still further embodiments, superimposing the closed captioning data onto the live image data includes superimposing the closed captioning data onto one of the objects of interest. In other embodiments, the method includes the step of, in response to receiving a selection of one of the objects of interest associated with second topics, sending a query to the augmented reality platform entity that includes the corresponding one of the second topics.

In another embodiment, the method includes the step of, in response to receiving a selection of the interactive element within the displayed closed captioning data, sending a query to the augmented reality platform entity that includes the corresponding first topic. In some embodiments, the method includes the steps of, in response to receiving a query result from the augmented reality platform entity, presenting a scrubber track, a scrubber, and a plurality of event points, the plurality of event points indicative chronological categories associated with the query result, and displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In another embodiment of the present application, an end-user device includes memory with an application and a processor communicatively coupled to the memory. The application, when executed, causing the processor to present, on a display, live image data being captured by a camera of the end-user device, determine a pose of the end-user device, the pose including a location of the end-user device, send the pose of the end-user device to an augmented reality platform entity, receive closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including an indication of a first topic embedded within the closed captioning data, and superimpose the closed captioning data incorporating an interactive element associated with the first topic onto the live image data.

In some embodiments, the application, when executed, causes the processor to highlight objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic. In other embodiments, to highlight the objects of interest in the displayed live image data being captured by the camera, the application, when executing, causes the processor to send the pose of the end-user device to an augmented reality platform entity, the pose including the location and orientation of the end-user device, and receive the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In still further embodiments, to superimpose the closed captioning data onto the live image data, the application, when executing, causes the processor to superimpose the closed captioning data onto one of the objects of interest. In another embodiment, the application, when executing, causes the processor to, in response to receiving a selection of one of the objects of interest associated with second topics, send a query to the augmented reality platform entity that includes the corresponding one of the second topics.

In yet another example, the application, when executing, causes the processor to, in response to receiving a selection of interactive element within the displayed closed captioning data, send a query to the augmented reality platform entity that includes the corresponding first topic. In some embodiments, the application, when executing, causes the processor to, in response to receiving a query result from the augmented reality platform entity present a scrubber track, a scrubber, and a plurality of event points, the plurality of event points indicative chronological categories associated with the query result, and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In a further embodiment of the present application, a tangible computer readable medium includes instructions that, when executed, cause an end-user device to present, on a display of an end-user device, live image data being captured by a camera of the end-user device, determine a pose of the end-user device, the pose including a location of the end-user device, send the pose of the end-user device to an augmented reality platform entity, receive closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including an indication of a first topic embedded within the closed captioning data, and superimpose the closed captioning data incorporating an interactive element associated with the first topic onto the live image data.

In some embodiments, the instructions, when executed, cause the end-user device to highlight objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic. In other embodiments, to highlight the objects of interest in the displayed live image data being captured by the camera, the instructions, when executed, cause the end-user device to send the pose of the end-user device to an augmented reality platform entity, the pose including the location and orientation of the end-user device and receive the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In still further embodiments, superimposing the closed captioning data onto the live image data includes superimposing the closed captioning data onto one of the objects of interest. In another embodiment, the instructions, when executed, cause the end-user device to, in response to receiving a selection of the interactive element within the closed captioning data, send a query to the augmented reality platform entity that includes the corresponding first topic. In another embodiment, the instructions, when executed, cause the end-user device to, in

response to receiving a query result from the augmented reality platform entity present a scrubber track, a scrubber, and a plurality of event points, the plurality of event points indicative chronological categories associated with the query result, and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In a further embodiment of the present application, a method includes the steps of: presenting, on a display of an end-user device, a first map associated with a first topic included in a query sent to an augmented reality platform entity; highlighting areas of interest on the first map, the areas of interest associated with second topics; presenting a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the event points indicative of second maps related to the first topic associated with different dates; and in response to receiving, with an input device, a selection of one of the areas of interest, sending a query to the augmented reality platform entity that includes the corresponding second topic. In some embodiments, including in response to receiving, with the input device, a change in position of the scrubber along the scrubber track to one of the plurality of event points, displaying the second map associated with the corresponding one of the plurality of event points.

In other embodiments, the method includes the steps of receiving search results based on the query, the query results includes records organized into at least first hierarchies, second hierarchies, and third hierarchies, and superimposing an interface over the first map initially displaying the first hierarchies. In a further embodiment, the first hierarchies are displayed in a first window, and the method includes the steps of, in response to receiving a selection of one the first hierarchies, displaying the second hierarchies associated with the selected one the first hierarchies in a second window, and, in response to receiving a selection of one of the second hierarchies, displaying the third hierarchies associated with the selected one the second hierarchies in a third window, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies. In another embodiment, the first hierarchies are displayed in a circular window, and the method includes the steps of, in response to receiving a selection of one the first hierarchies, displaying the second hierarchies associated with the selected one the first hierarchies in a first concentric ring around the circular window, and, in response to receiving a selection of one of the second hierarchies, displaying the third hierarchies associated with the selected one the second hierarchies in a second concentric ring around the first concentric ring, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies. In a still further embodiment, the plurality of event points is a first plurality of event points, and the method includes the steps of hiding the first plurality of event points and displaying a second plurality of event points, the second plurality of event points indicative of ones of the search results associated with chronological categories. In another embodiment, the method includes the step of, in response to receiving, with the input device, a change in position of the scrubber along the scrubber track to one of the second plurality of event points, providing the ones of the search results associated with the corresponding chronological category.

In another embodiment of the present application, an end-user device includes memory with an application and a processor communicatively coupled to the memory. The application, when executed, causing the processor to: present, on a display of the end-user device, a first map associated with a first topic included in a query sent to an augmented reality platform entity; highlight areas of interest on the first map, the areas of interest associated with second topics; present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the event points indicative of second maps related to the first topic associated with different dates; and, in response to receiving, with an input device, a selection of one of the areas of interest, send a query to the augmented reality platform entity that includes the corresponding second topic. In some embodiments, the application, when executing, causes the processor to, in response to receiving a change in position of the scrubber along the scrubber track, with the input device, to one of the plurality of event points, display the second map associated with the corresponding one of the plurality of event points. In other embodiments, the application, when executing, causes the processor to: receive search results based on the query, the query results includes records organized into at least first hierarchies, second hierarchies, and third hierarchies; and superimpose an interface over the first map initially displaying the first hierarchies.

In another embodiment, the first hierarchies are displayed in a first window, and the application, when executing, causes the processor to: in response to receiving a selection of one the first hierarchies, display the second hierarchies associated with the selected one the first hierarchies in a second window; and in response to receiving a selection of one of the second hierarchies, display the third hierarchies associated with the selected one the second hierarchies in a third window, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies. In a further embodiment, the first hierarchies are displayed in a circular window, and wherein the application, when executing, causes the processor to: in response to receiving a selection of one the first hierarchies, display the second hierarchies associated with the selected one the first hierarchies in a first concentric ring around the circular window; and in response to receiving a selection of one of the second hierarchies, display the third hierarchies associated with the selected one the second hierarchies in a second concentric ring around the first concentric ring, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies.

In a still further embodiment, the plurality of event points is a first plurality of event points, and the application, when executing, causes the processor to: hide the first plurality of event points; and display a second plurality of event points, the second plurality of event points indicative of ones of the search results associated with chronological categories.

In another embodiment, the application, when executing, causes the processor to, in response to receiving with the input device, a change in position of the scrubber along the scrubber track to one of the second plurality of event points, providing the ones of the search results associated with the corresponding chronological category.

In another embodiment of the present application, a tangible computer readable medium includes instructions that, when executed, cause an end-user device to: present, on a display, a first map associated with a first topic included in a query sent to an augmented reality platform entity; highlight areas of interest on the first map, the areas of interest

associated with second topics; present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the event points indicative of second maps related to the first topic associated with different dates; and in response to receiving, with an input device, a selection of one of the areas of interest, send a query to the augmented reality platform entity that includes the corresponding second topic. In a further embodiment, the instructions, when executed, cause the end-user device to, in response to receiving, with the input device, a change in position of the scrubber along the scrubber track to one of the plurality of event points, display the second map associated with the corresponding one of the plurality of event points. In another embodiment, the instructions, when executed, cause the end-user device to: receive search results based on the query, the query results includes records organized into at least first hierarchies, second hierarchies, and third hierarchies; and superimpose an interface over the first map initially displaying the first hierarchies. In a further embodiment, the first hierarchies are displayed in a first window, and wherein the instructions, when executed, cause the end-user device to: in response to receiving a selection of one the first hierarchies, display the second hierarchies associated with the selected one the first hierarchies in a second window; and in response to receiving a selection of one of the second hierarchies, display the third hierarchies associated with the selected one the second hierarchies in a third window, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies.

In a further embodiment, the first hierarchies are displayed in a circular window, and the instructions, when executed, cause the end-user device to, in response to receiving a selection of one the first hierarchies, display the second hierarchies associated with the selected one the first hierarchies in a first concentric ring around the circular window, and, in response to receiving a selection of one of the second hierarchies, display the third hierarchies associated with the selected one the second hierarchies in a second concentric ring around the first concentric ring, the third hierarchies to include selectable uniform resource locators to retrieve entries associated with the third hierarchies. In another embodiment, the plurality of event points is a first plurality of event points, and wherein the instructions, when executed, cause the end-user device to: hide the first plurality of event points; display a second plurality of event points, the second plurality of event points indicative of ones of the search results associated with chronological categories; and, in response to receiving, with the input device, a change in position of the scrubber along the scrubber track to one of the second plurality of event points, provide the ones of the search results associated with the corresponding chronological category.

In another embodiment of the present application, a method includes the steps of: presenting, on a display of an end-user device, map geometry data; highlighting objects of interest in the displayed map geometry data, the objects of interest associated with a topic; in response to receiving, with an input device, a selection of one of the objects of interest, sending a query to an augmented reality platform entity that includes the corresponding topic. The method further includes the steps of, in response to receiving a query result from the augmented reality platform entity, presenting a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points. In another embodiment, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In a further embodiment, the method includes the step of, in response to receiving a selection of one of the database content providers of the first hierarchy, displaying a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In a still further embodiment, the method includes the step of, in response to receiving a selection of one of the topics of the second hierarchy, displaying a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber. In some embodiments, the method includes the step of, based on the position of the scrubber, superimposing an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In other embodiments, the method includes the step of, for the objects of interest, superimposing an information window that includes a portion of search results for the corresponding topic. In still further embodiments, the method includes the step of determining which portion of the map geometry data to present based on the orientation of the end-user device.

In another embodiment of the present application, an end-user device includes memory with an application and a processor communicatively coupled to the memory. The application, when executed, causing the processor to: present, on a display, map geometry data; highlight objects of interest in the displayed map geometry data, the objects of interest associated with a topic; and, in response to receiving, with an input device, a selection of one of the objects of interest, send a query to an augmented reality platform entity that includes the corresponding topic. The method further includes the steps of, in response to receiving a query result from the augmented reality platform entity: present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In another embodiment, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In a further embodiment, the application, when executing, causes the processor to, in response to receiving a selection of one of the database content providers of the first hierarchy, display a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In a further embodiment, the application, when

executing, causes the processor to, in response to receiving a selection of one of the topics of the second hierarchy, display a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber.

In some embodiments, the application, when executing, causes the processor to, based on the position of the scrubber, superimpose an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In other embodiments, the application, when executing, causes the processor to, for the objects of interest, superimposing an information window that includes a portion of search results for the corresponding topic. In still further embodiments, the application, when executing, causes the processor to determining which portion of the map geometry data to present based on the orientation of the end-user device.

In another embodiment of the present application, a tangible computer readable medium includes instructions that, when executed, cause an end-user device to: present, on a display, map geometry data; highlight objects of interest in the displayed map geometry data, the objects of interest associated with a topic; and, in response to receiving, with an input device, a selection of one of the objects of interest, send a query to an augmented reality platform entity that includes the corresponding topic. The instructions further cause the end-user device to, in response to receiving a query result from the augmented reality platform entity: present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In some embodiments, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In other embodiments, the instructions, when executed, cause the end-user device to, in response to receiving a selection of one of the database content providers of the first hierarchy, display a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In still further embodiments, the instructions, when executed, cause the end-user device to, in response to receiving a selection of one of the topics of the second hierarchy, display a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber. In yet further embodiments, the instructions, when executed, cause the end-user device to, based on the position of the scrubber, superimposing an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In yet another embodiment, the instructions, when executed, cause the end-user device to, for the objects of interest, superimposing an information window that includes a portion of search results for the corresponding topic.

In a further embodiment of the present applications, a method includes the steps of: presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device; highlighting objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic; and, in response to receiving, with an input device, a selection of one of the objects of interest, sending a query to the augmented reality platform entity that includes the corresponding topic. The method further includes the steps of, in response to receiving a query result from the augmented reality platform entity: presenting a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In another embodiment, the step of highlighting the objects of interest in the displayed live image data being captured by the camera includes: determining, with a processor, a pose of the end-user device, the pose including a location of the end-user device and an orientation of the camera of the end-user device; sending the pose of the end-user device to an augmented reality platform entity; and receiving the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In further embodiments, the method includes, for the objects of interest, superimposing an information window that includes a portion of search results for the corresponding topic. In a still further embodiment, the method includes, based on the position of the scrubber, superimposing an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In a still further embodiment, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In another embodiment, the method includes, iin response to receiving a selection of one of the database content providers of the first hierarchy, displaying a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In a still further embodiment, the method includes, in response to receiving a selection of one of the topics of the second hierarchy, displaying a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber.

In another embodiment of the present application, an end-user device includes memory with an application and a processor communicatively coupled to the memory. The application, when executed, causing the processor to: present, on a display, live image data being captured by a camera of the end-user device; highlight objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic; and in response to receiving, with an input device, a selection of one of the objects of interest, send a query to the augmented reality

platform entity that includes the corresponding topic. The application further causes the processor to, in response to receiving a query result from the augmented reality platform entity: present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In another embodiment, to highlight the objects of interest in the displayed live image data being captured by the camera, the application, when executing, causes the processor to: determine, with a processor, a pose of the end-user device, the pose including a location of the end-user device and an orientation of the camera of the end-user device; send the pose of the end-user device to an augmented reality platform entity; receive the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In a further embodiment, the application, when executing, causes the processor to, for the objects of interest, superimpose an information window that includes a portion of search results for the corresponding topic. In another embodiment, the application, when executing, causes the processor to, based on the position of the scrubber, superimposing an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In a still further embodiment, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In yet another embodiment, the application, when executing, causes the processor to, in response to receiving a selection of one of the database content providers of the first hierarchy, display a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In another embodiment, the application, when executing, causes the processor to, in response to receiving a selection of one of the topics of the second hierarchy, displaying a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber.

In another embodiment of the present application, a tangible computer readable medium comprising instructions that, when executed, cause an end-user device to: present, on a display of an end-user device, live image data being captured by a camera of the end-user device; highlight objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic; and, in response to receiving, with an input device, a selection of one of the objects of interest, send a query to the augmented reality platform entity that includes the corresponding topic. The instructions further cause the end-user device to, in response to receiving a query result from the augmented reality platform entity: present a scrubber track, a scrubber, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories associated with the query result; and display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

In another embodiment, to highlight the objects of interest in the displayed live image data being captured by the camera, the instructions, when executed, cause the end-user device to: determine, with a processor, a pose of the end-user device, the pose including a location of the end-user device and an orientation of the camera of the end-user device; send the pose of the end-user device to an augmented reality platform entity; and receive the objects of interest from the augmented reality platform entity based on the pose of the end-user device. In another embodiment, the instructions, when executed, cause the end-user device to, based on the position of the scrubber, superimpose an image onto the map geometry data over one of the objects of interest, the image being the one of the objects of interest during the chronological categories indicated by the scrubber. In a still further embodiment, the first hierarchy is displayed in a first window, and the first hierarchy displays a list of database content providers associated with the query results with dates within one of the chronological categories indicated by the scrubber. In another embodiment, the instructions, when executed, cause the end-user device to, in response to receiving a selection of one of the database content providers of the first hierarchy, display a second hierarchy in a second window, the second hierarchy including a list of topics associated with the query results associated with the selected database content providers and associated with within the one of the chronological categories indicated by the scrubber. In a still further embodiment, the instructions, when executed, cause the end-user device to, in response to receiving a selection of one of the topics of the second hierarchy, display a third hierarchy in a third window, the second hierarchy including a list of uniform resource locators of entries associated with the selected topic and associated with within the one of the chronological categories indicated by the scrubber.

In another embodiment of the present application, a method includes the steps of: generating, with a processor, records for entries from a plurality of database content providers, the records identifying topics included in the entries and dates associated with the entries; and analyzing the entries from the plurality of database content providers to determine affinities between the topics. The method further includes the steps of, in response to receiving a query that includes a search topic from an end-user device: retrieving, from a database, records identifying the search topic and related topics that have affinity with the search topic; organizing, with the processor, the records into chronological categories based on the dates associated with the corresponding entries, each one of the chronological categories representing a different period of time, the chronological categories being based on a number of the dates associated with the retrieved records and a clustering of dates associated with the retrieved records; for each of the chronological categories, generating a query result with the processor, the query result organizing the records into hierarchies based on attributes of the entries associated with the records; and sending the query result to the end-user device. In another embodiment, the hierarchies include at least first hierarchies, second hierarchies, and third hierarchies.

In a further embodiment, organizing the query result into the hierarchies includes: organizing the records into the first hierarchies based on which of the plurality of database

content providers is associated with the records; for each of the plurality of database content providers in the first hierarchies, organizing the records into the second hierarchies based on the corresponding topics; and, for each of the topics in the second hierarchies, organizing the records into the third hierarchies based on a category of the entries associated with the records. In a still further embodiment, generating the records for the entries from the plurality of database content providers includes, for each of the entries, determining whether the entry is an image; and, in response to the entry being an image, determining the topics associated with the image based on at least one of metadata included in the image, image recognition performed on the image, or articles in which the image is used. In another embodiment, each of the chronological categories are associated with an event mark when the query results are displayed on the end-user device. In another embodiment, the method includes the step of comparing words in the entries match topic records in a topic database to identify which of the topics are includes in the entries. In a further embodiment, the method includes the step of analyzing the entries from the plurality of database content providers to determine potential topics to be added to the topic database.

In a further embodiment of the present application, a system includes memory having instructions and a processor communicatively coupled to the memory. The instructions, when executed, causing the processor to: generate records for entries from a plurality of database content providers, the records identifying topics included in the entries and dates associated with the entries; and analyze the entries from the plurality of database content providers to determine affinities between the topics. The instructions further cause the processor to, in response to receiving a query that includes a search topic from an end-user device: retrieve, from a database, records identifying the search topic and related topics that have affinity with the search topic; organize the records into chronological categories based on the dates associated with the corresponding entries, each one of the chronological categories representing a different time period, the time periods associated with the chronological categories being based on a number of the dates associated with the retrieved records and a clustering of dates associated with the retrieved records; for each of the chronological categories, generate a query result with the processor, the query result organizing the records into hierarchies based on attributes of the entries associated with the records; and send the query result to the end-user device. In another embodiment, the hierarchies include at least first hierarchies, second hierarchies, and third hierarchies. In a further embodiment, to organize the query result into the hierarchies, the processor is to: organize the records into the first hierarchies based on which of the plurality of database content providers is associated with the records; for each of the plurality of database content providers in the first hierarchies, organize the records into the second hierarchies based on the corresponding topics; and for each of the topics in the second hierarchies, organize the records into the third hierarchies based on a category of the entries associated with the records. In yet another embodiment, where to generate the records for the entries from the plurality of database content providers, the processor is to, for each of the entries: determine whether the entry is an image; and in response to the entry being an image, determine the topics associated with the image based on at least one of metadata included in the image, image recognition performed on the image, or articles in which the image is used. In a still further embodiment, the chronological categories are each associated with an event marker when the query results are displayed on the end-user device. In another embodiment, the processor is to compare words in the entries match topic records in a topic database to identify which of the topics are includes in the entries. In a further embodiment, the processor is to analyze the entries from the plurality of database content providers to determine potential topics to be added to the topic database.

In another embodiment of the present application, a tangible computer readable medium includes instructions that, when executed, cause a server to: generate records for entries from a plurality of database content providers, the records identifying topics included in the entries and dates associated with the entries; and analyze the entries from the plurality of database content providers to determine affinities between the topics. The instructions further cause the server to, in response to receiving a query that includes a search topic from an end-user device: retrieve, from a database, records identifying the search topic and related topics that have affinity with the search topic; organize the records into chronological categories based on the dates associated with the corresponding entries, each one of the chronological categories representing a different time period, the time periods associated with the chronological categories being based on a number of the dates associated with the retrieved records and a clustering of dates associated with the retrieved records; for each of the chronological categories, generate a query result with the processor, the query result organizing the records into hierarchies based on attributes of the entries associated with the records; and send the query result to the end-user device. In another embodiment, the hierarchies include at least first hierarchies, second hierarchies, and third hierarchies. In yet another embodiment, the instructions, when executed, cause the server to: organize the records into the first hierarchies based on which of the plurality of database content providers is associated with the records; for each of the plurality of database content providers in the first hierarchies, organize the records into the second hierarchies based on the corresponding topics; and for each of the topics in the second hierarchies, organize the records into the third hierarchies based on a category of the entries associated with the records. In a still further embodiment, to generate the records for the entries from the plurality of database content providers, the instructions cause the server to, for each of the entries: determine whether the entry is an image; and, in response to the entry being an image, determine the topics associated with the image based on at least one of metadata included in the image, image recognition performed on the image, or articles in which the image is used. In yet another embodiment, the chronological categories are associated with event markers when the query results are displayed on the end-user device. In a further embodiment, the instructions, when executed cause the server to: compare words in the entries match topic records in a topic database to identify which of the topics are includes in the entries; and analyze the entries from the plurality of database content providers to determine potential topics to be added to the topic database.

In a still further embodiment of the present application, a method includes the steps of: presenting, on a display of an end-user device, map geometry data; presenting a scrubber track, a position marker, and a plurality of event points along the scrubber track, the plurality of event points indicative chronological categories; and displaying indicia in the displayed map geometry data when one of the chronological categories corresponding to a timestamp associated with the indicia is selected by a position of the position marker on the

scrubber track corresponding to an associated one of the plurality of event points, the indicia being each associated with an event; in response to receiving, with an input device, a selection of one of the indicia, sending a query to an augmented reality platform entity that includes topic related the corresponding event; and displaying a first hierarchy of a plurality of hierarchies associated with records included in a query result received from the augmented reality platform entity relating to the selected indicia.

In a further embodiment of the present application, a method includes the steps of: presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device; determining a pose of the end-user device, the pose including a location of the end-user device; sending the pose of the end-user device to an augmented reality platform entity; receiving tracking data for athletes in the image data based on the pose of the end-user device; superimposing the tracking data on the locations of the athletes in the live image data being captured by a camera of the end-user device; in response to receiving a selection of the superimposed tracking data of one of the athletes, sending a query to the augmented reality platform entity that includes an identity of the selected athlete; and displaying a first hierarchy of a plurality of hierarchies associated with records included in a query result received from the augmented reality platform entity relating to the selected athlete.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, reference may be made to embodiments shown in the following drawings. The components in the drawings are not necessarily to scale and related elements may be omitted, or in some instances proportions may have been exaggerated, so as to emphasize and clearly illustrate the novel features described herein. In addition, system components can be variously arranged, as known in the art. Further, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. **1** illustrates a system diagram of an augmented reality platform entity providing query results in response to receiving queries from end-user devices in accordance to the teachings of this disclosure.

FIG. **2** illustrates an example data structure that may be used to store the entry records in the augmented reality platform database.

FIG. **3** illustrates an example data structure that may be used to form the query.

FIG. **4** illustrates an example data structure used to form the query results.

FIG. **5** illustrates a diagram of a navigation map for a user to search content with the end-user device of FIG. **1**.

FIG. **6** depicts an interface presented by the end-user device of FIG. **1** to facilitate presenting and interacting with the query results.

FIG. **7** depicts another interface presented by the end-user device of FIG. **1** to facilitate presenting and interacting with the query results.

FIG. **8** depicts another interface presented by the end-user device of FIG. **1** to facilitate presenting and interacting with the query results.

FIG. **9** depicts a map geometry interface presented by the end-user device of FIG. **1** to facilitate generating the query and presenting and interacting with the query results.

FIG. **10** depicts a map interface presented by the end-user device of FIG. **1** to facilitate generating the query and presenting and interacting with the query results.

FIG. **11** depicts an augmented reality interface presented by the end-user device of FIG. **1** to facilitate generating the query and presenting and interacting with the query results.

FIG. **12** is a block diagram of the database sorter of FIG. **1** that generates entry records.

FIG. **13** is a block diagram of a query responder of the augmented reality platform entity of FIG. **1**.

FIG. **14** is a block diagram of a query generator of the augmented reality platform handler of FIG. **11**.

FIG. **15** is a flowchart of a method to index entries from content database providers, which may be implemented by the processor platform of FIG. **25**.

FIG. **16** is a flowchart of a method to generate the queries and present the query results, which may be implemented by the electronic components of FIG. **26**.

FIG. **17** is a flowchart of a method to present the query results, which may be implemented by the electronic components of FIG. **26**.

FIG. **18** is a flowchart of a method to present the query results, which may be implemented by the electronic components of FIG. **26**.

FIG. **19** is a flowchart of a method to present the query results, which may be implemented by the electronic components of FIG. **26**.

FIG. **20** is a flowchart of a method to present the query results in conjunction with map geometry data, which may be implemented by the electronic components of FIG. **26**.

FIG. **21** a flowchart of a method to present the query results in conjunction with map data, which may be implemented by the electronic components of FIG. **26**.

FIG. **22** a flowchart of a method to present the query results in conjunction with live image data from a camera, which may be implemented by the electronic components of FIG. **26**.

FIG. **23** illustrates the augmented reality interface of FIG. **11** providing location specific content superimposed on live images captured by the end-user device of FIG. **1**.

FIG. **24** is a flowchart of a method to detect and provide location specific content superimposed on live images captured by the end-user device of FIG. **1**, which may be implemented by the electronic components of FIG. **26**.

FIG. **25** is a block diagram of a processor platform that may implement the method of FIG. **15**.

FIG. **26** is a block diagram of electronic components that may implement the methods of FIGS. **16-22**, and **24**.

FIG. **27** depicts a law enforcement map interface presented by the end-user device of FIG. **1** to facilitate generating the query and presenting and interacting with the query results related to law enforcement and emergency services.

FIG. **28** illustrates the augmented reality interface of FIG. **11** providing location specific sporting event content superimposed on live images captured by the end-user device of FIG. **1**.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

While the invention may be embodied in various forms, there are shown in the drawings, and will hereinafter be described, some exemplary and non-limiting embodiments, with the understanding that the present disclosure is to be considered an exemplification of the invention and is not intended to limit the invention to the specific embodiments illustrated.

As end-user devices (e.g., computers, gaming consoles, smart phones, tablets, smart televisions, over-the-top devices, optical head-mounted displays, augmented reality

smart glasses, virtual reality headsets, cockpit displays, virtual cockpits, etc.) are developed to include more processing power and better input devices, users expect a more immersive experience that facilitates utilizing the environment around them for entertainment, richer content (e.g., context aware content) and more useful information. As disclosed below, an augmented reality platform entity provides an interface to facilitate a user, via an end-user device, searching for information based on contextual information in images, maps, map geometry data, and/or live video (e.g., via augmented reality, virtual reality, etc.). As used herein, "augmented reality" refers to a live video of an environment captured by a camera that includes elements superimposed on the live view including computer-generated sounds, images, and/or videos, etc. As used herein, "map geometry data" refers to spatial data on an area that facilitates (i) identifying of points of interest (e.g., buildings, infrastructure, landmarks, etc.) within an associated image and/or (b) determining the location and orientation of points of interest with reference to the location of the end-user device and orientation of a camera of the end-user device. The map geometry data provides information so that the end-user device is virtually at the location viewed on the en-user device. The map geometry data may include representations of locations that do not presently exist. For example, the map geometry data may include graphical representations of structures that do not currently exist, but may be planned for the future or existed in the past.

The augmented reality platform entity indexes entries from content database providers. Additionally, in some examples, the augmented reality platform entity facilitates creation of entries by end-users and indexes those entries. As used herein, "entries" are discrete pieces of content (e.g., articles, images, websites, videos, advertisements, records, map geometry, social media information, etc.) stored by the content database providers and/or created by end-users. The content database providers store and provide various types of entries. For example, content database providers include publishers (e.g., newspapers, magazines, electronic book depositories, blogs, media outlets, etc.), search engines (e.g., Google®, Bing®, Baidu®, etc.), public information offices (e.g., property records, criminal records, incorporation records, licensing records, etc.), research providers (e.g., LexisNexis®, Westlaw®, Bloomberg®, etc.), social media companies (e.g. Facebook®, Twitter®, Weibo®, etc.) map geometry providers (e.g., Google®, Apple®, Tencent®, etc.), institutional providers (e.g., libraries, museums, private collections, etc.) education providers (e.g., universities, community colleges, secondary schools, etc.), advertisers, entertainment (e.g., Netflix®, Hulu®, etc.), and/or audiovisual providers (e.g., Youtube®, Vimeo®, Spotify®, etc.). Some content database providers provide public access (e.g., via the World Wide Web, etc.) to the entries. Other content database providers provide access to authorized users (e.g., via login credentials, via keys, etc.) Some content providers provide access via an Application Program Interface (API). In some examples, the augmented reality platform entity searches for and indexes the databases via network and Internet protocols (e.g., HTML, FTP, etc.).

The augmented reality platform entity analyzes the entries from the content database providers to identify topics (e.g., a person, place, thing, or event) within the entries. For example, if an entry being analyzed is a real estate listing from a real estate database, the augmented reality platform entity may identify the street of the property, the municipality in which the property is located, previous owners of the property, crime statistics, and/or county recorder records, etc. The augmented reality platform entity generates tags for the entries that uniquely identify the topics associated with the entries. The augmented reality platform entity then creates records for the entries with the tags, metadata associated with the entries (e.g., title, geographical coordinates, dates associated with the entry, etc.), and/or a Uniform Resource Identifier (URI) that identifies the location on a network at which the entry is accessible. In some examples, the URI is a Uniform Resource Location (URL) that provides a protocol identifier (e.g., http, https, ftp, etc.) and an identifier of the on a network (e.g., an intranet, the Internet, etc.). Additionally, through analyzing the entries from the various content database providers, the augmented reality platform entity determines affinities (e.g., co-occurrence relationships) between topics. For example, the topic of the "Rookery Building" may be connected to the topics of "Daniel Burnham," "Frank Lloyd Wright," "Roman Revival Architecture," and "Burnham & Root," etc.

After receiving a query from an end-user device, the augmented reality platform entity determines which records are responsive to the query based on the topic(s) contained in the query and other topics related (e.g., have affinity and are relevant, etc.) to those topics. The augmented reality platform entity generates a response that includes metadata (e.g., title, author, size, etc.) and the URI associated with the responsive records. In some examples, the augmented reality platform entity receives pre-query data from the end-user device. In such examples, the pre-query data includes map geometry data, image date, device pose data (e.g., location and orientation), and/or image depth mapping (e.g., from a LiDAR and/RADAR on the device). In such examples, the augmented reality platform entity identifies (e.g. via image recognition, via coordinate and orientation analysis, image depth mapping analysis, etc.) topics in the pre-query data that the user may select to form a query. For example, based on the pre-query data (the coordinates of a phone, orientation data regarding the camera of the phone, and field of view data of the camera of the phone, etc.) and map geometry data from one of the map geometry database providers, the augmented reality platform entity may determine that the image in the pre-query data includes the Rookery Building and the Chicago Board of Trade building.

The end-user devices display an interface to facilitate users (i) submitting queries, (ii) browsing the responses to the queries, and (iii) selecting and viewing the content associated with the responses. The end-user device includes visual, audio, and/or haptic outputs. The visual outputs may include a screen (e.g., a screen on a phone, a tablet, a virtual reality headset, a virtual cockpit, etc.) or a projection onto a transparent surface (e.g., the panels of an optical head-mounted display, augmented reality smart glasses, a heads up display, a cockpit glass display, etc.). The interface includes a scrubber track and a scrubber that controls the results that are currently display on the end-user device. In some examples, the results are listed in chronological order and the scrubber track and the scrubber facilitates scrolling through the results chronologically. In such examples, the scrubber track includes event points indicative of results corresponding to a particular periods of time (e.g., weeks, months, years, decades, etc.). When the scrubber is moved to a particular event point, the interface displays results associated with corresponding period of time. For example, if the scrubber is moved to an event point associated with the year 1893, the interface may display results associated the year 1893 (e.g., articles written in 1893, images from 1893, videos about events in 1893, articles about people alive in 1983, etc.) In some examples, the results are listed based on

relevance score and the scrubber track and the scrubber facilitates scrolling through the results based on relevance to the query.

The end-user devices include inputs to facilitate (a) manually entering a query and browsing results (e.g., a touch screen, a mouse, a controller, microphones, etc.), tracking a user (e.g., a finger, eye gaze location, etc.) to enter queries and browse results (e.g., a forward-facing camera, back-facing cameras, etc), and/or (c) gathering data for the interface to identify and/or suggest queries (e.g., back-facing cameras, global positioning system (GPS) receivers, accelerometers, etc.). In some examples, based on the inputs, the end-user device sends pre-query data to the augmented reality platform entity for the augmented reality platform entity to identify and/or suggest topics for queries. For example, the end-user device may send an image of the Cloud Gate sculpture, the coordinated of the end-user device (e.g., 41.882772 and −87.622958), and the orientation of the end-user device (e.g., 225 degrees from true north). In such an example, the augmented reality platform entity may identify the Cloud Gate sculpture as a suggested topic. In such an example, the end-user devices highlights (e.g., superimposes a semi-transparent image) the Cloud Gate sculpture as it is being captured by the camera. In such an example, the end-user device sends a query with the Cloud Gate sculpture as a topic in response to the user (e.g., via the touch screen) indicating interest in the highlighted Cloud Gate sculpture.

FIG. **1** illustrates a system diagram of an augmented reality platform entity (ARPE) **100** providing query results **102** in response to receiving queries **104** from end-user devices **106** in accordance to the teachings of this disclosure. The example ARPE **100**, the example end-user devices **106**, and example content database providers **108** are communicatively coupled via a network (e.g., an intranet, the Internet, etc.). The example end-user devices **106** include computers (e.g., Window®-based computers, iOS®-based computers, Linux-based computers, etc.), smart phones (e.g., Android™-based phones, iOS-based phones, Windows® Mobile-based phones, etc.), tablets (e.g., iPad®, Google Pixel®, etc.), smart televisions, over-the-top devices (e.g., Apple TV®, Chromecast™, Amazon Fire®, etc.) optical head-mounted displays (e.g. Google Glass, Vuzix M300, etc.), augmented reality smart glasses (e.g., Microsoft® HoloLens, etc.), virtual reality headsets (e.g., Oculus Rift, HTC Vive, etc.), vehicle center console displays, heads up displays, virtual cockpits, glass cockpits, and/or global positioning system (GPS) devices, etc. As disclosed in more detail below in FIGS. **14** and **15** below, the end-user devices **106** present the query results **102** to a user and receive input from the user to form the queries **104** and navigate the entries associated with the query results **102**.

The content database providers **108** generate and/or store content (e.g., articles, websites, images, records, maps, map geometry data, videos, etc.) that is accessible via a Uniform Resource Indicator (URI), such as a Uniform Resource Locator (URL). Some content database providers **108** provide open access (e.g., without credentials), while other content database providers **108** provide access to the corresponding content through a login. In the illustrated example, the content database providers **108** include content database providers include publishers (e.g., newspapers, magazines, electronic book depositories, blogs, media outlets, broadcasters (live and pre-taped), etc.), search engines (e.g., Google®, Bing®, Baidu®, etc.), public information offices (e.g., property records, criminal records, incorporation records, licensing records, etc.), research providers (e.g., LexisNexis®, Westlaw®, Bloomberg®, etc.), social media companies (e.g. Facebook®, Twitter®, Weibo®, etc.) map geometry providers (e.g., Google®, Apple®, Tencent®, etc.), institutional providers (e.g., libraries, museums, private collections, etc.) education providers (e.g., universities, community colleges, secondary schools, etc.), advertisers, entertainment (e.g., Netflix®, Hulu®, etc.), and/or audiovisual providers (e.g., Youtube®, Vimeo®, Spotify®, Twitch®, etc.).

In the illustrated example, the ARPE **100** includes a database sorter **110**, an augmented reality platform (ARP) database **112**, a user handler **114**, a user database **116**, a session handler **118**, and a query responder **120**. As disclosed in more detail in FIG. **9** below, the example database sorter **110** analyzed entries from content database providers **108**. The entries are discrete pieces of content that are associated with a URI that may be accessed by the end-user device **106** via the URI. For an entry, the database sorter **110** determines which topic(s) are relevant to the entry, and creates an entry record to store in the ARP database **112** that include the identified topic(s), metadata that identifies the entry (e.g., a title, a thumbnail, an author) and the associated content database provide **108**, and the URI to access the entry. In some examples, the database sorter **110** also assigns one or more dates to the entry record. For example, an entry about the great Chicago fire may be assigned a dates of Oct. 8, 1871, Oct. 9, 1871, and Oct. 10, 1871. Additionally, in some examples, the database sorter **110** determines affinities between the topics. An affinity is a measure of a likelihood of the co-occurrence of two or more topics in an entry. Topics with high affinity may be considered related. For example, the topic of "S. R. Crown Hall" may have a high affinity with the topic of "Ludwig Mies van der Rohe." That is, if a query **104** includes the topic of "S. R. Crown Hall," the user may be also interested in the topic of "Ludwig Mies van der Rohe."

FIG. **2** illustrates an example data structure **200** that may be used to store the entry records (e.g. the entry records **1200** of FIG. **12** below) in the ARP database **112**. In the illustrated example, the data structure **200** includes a record identifier (ID) field **202**, a content database provider (CDP) ID field **204**, a topic ID field **206**, a topic metadata field **208**, topic date field **210**, and a URI field **212**. The example record ID field **202** includes a numeric or an alphanumeric value that uniquely identifies the entry record. The example CDP ID field **204** includes a numeric, an alphanumeric, or an alphabetic value that uniquely identifies the content database provider **108** from which the entry record was created. The example topic ID field **206** includes a numeric, an alphanumeric, or an alphabetic value that uniquely identifies the topic(s) assigned to the entry record. The topic metadata field **208** includes a set of values to be used to inform the user about the content at the associated URI (e.g., as identified by the URI field **212**, etc.). For example, the topic metadata field **208** may include a title, an author, a source name, and/or a download size, etc. The topic date field **210** identifies dates associated with the entry. The URI field **212** includes the URI at which the entry may be found. For example, the URI field **212** may include a URL, an international standard book number (ISBN), a universal product code (UPC), and/or a global trade item number (GTIN), etc. In such an example where the URI field **212** includes an object identifier (e.g., an ISBN, a UPC, a GTIN, etc.) instead of a URL, the end-user device **106** may use a preferred content database provider **108** (e.g., Amazon.com, the Library of Congress, etc.) when the entry associated with the object identifier is selected by the user.

Returning to FIG. **1**, the user handler **114** maintains the user database **116**. The when a user first registers with the ARPE **100** (e.g., via the end-user device **106**), the user handler **114** manages a registration process to create user records to store the user database **116**. The user handler **114** manages authentication (e.g., via login credentials, etc.) of users accessing the ARPE **100**. Additionally, the user handler **114** manages and updates the user records to reflect settings and preferences of the corresponding user. Example settings and preferences may include a preferred query result interface (e.g., the interfaces disclosed in FIGS. **3**, **4**, and **5** below), bookmarks, preferred content database providers, and/or subscriptions and credentials to content database providers, etc.

The example session handler **118** manages connections and communication with the end-user devices **106**. The end-user devices **106** communicatively couple to the session handler **118** via the network. The network may be a public network, such as the Internet; a private network, such as an intranet; or combinations thereof, and may utilize a variety of networking protocols now available or later developed including, but not limited to, TCP/IP-based networking protocols. The example session handler **118** receives the queries **104**, pre-query data (e.g., information that provides context to the location and environment of the end-user device **106**), registration data, login data, and/or preference data, etc. from the end-user devices **106**. The session handler **118** sends session data (e.g., session identifiers, authentication data, etc.), pre-query responses, and query results **102**.

FIG. **3** illustrates an example data structure **300** that may be used to form the query **104**. In the illustrated example, the data structure **300** includes an example session ID field **302**, an example user ID field **304**, an example query data field **306**, and an example device pose data field **308**. The session ID field **302** includes a numeric, an alphanumeric, or an alphabetic value that uniquely identifies a session associated with the end-user device **106** that send the query **104**. The example user ID field **304** includes a numeric, an alphanumeric, or an alphabetic value that uniquely identifies a user of the end-user device **106**. Preferences and settings may be obtained from the user database **116** with the value in the user ID field **304**. The query data field **306** includes data (e.g., string data, image data, coordinate data, etc.) to be used by the query responder **120** to generate the query results **102**. The device pose data field **308** includes information regarding the pose (e.g., the location, orientation, altitude, etc.) to the end-user device **106**.

As disclosed in more detail in FIG. **13** below, the example query responder **120** generates query results **102** in response to the queries **104** from the end-user devices **106**. To generate a query result **102**, the query responder **120** analyzes the topic(s) included in the query **104** and determines which of the query records in the ARP database **112** (a) are responsive (e.g., are about the topic(s) in the query **104** and are about topics that have a high affinity to the topic(s) in the query **104**), and (b) conform to the user's preferences. For example, in response to a query **104** that include the topic of "The Rookery Building," the query responder **120** may generate the query result **102** based on entry records indexed for topics such as "The Rookery Building," "Daniel Burnham," "Brooks Brothers," and "South La Salle Street," etc., and exclude entry records associated with content database providers that require a subscription.

FIG. **4** illustrates an example data structure **400** used to form the query results **102**. In the illustrated example, the query results are arranged in a hierarchy, based on the CDP ID field **204**, the topic ID field **206**, and then the entry record data (e.g., the topic metadata field **208**, the topic date field **210**, and the URI field **212**). However, the data structure **400** may be arranged in any other suitable manner (e.g., by the topic ID field **206** then the CDP ID field **204**, by the topic date field **210**, etc.). Alternatively, in some examples, the data structure **400** may be a flat list of entry record data structures **200** that is then organized into a hierarchy by the end-user device **106**.

FIG. **5** illustrates a diagram of a navigation map **500** for a user to search content with the end-user device **106** of FIG. **1**. In the illustrated example, the navigation map **500** includes a registration interface **502**, a login interface **504**, a home interface **506**, a custom updates interface **508**, a bookmarks interface **510**, and content navigation interfaces **512** to be displayed on a viewport **514**. The registration interface **502** facilitates a user creating an account to choose settings, set preferences, and create authentication credentials. Through the registration interface **502**, the user handler **114** creates a user record to be sorted in the user database **116**. The login interface **504** creates a session by facilitating a registered user entering authentication credentials. The home interface **506** facilitates selecting one of the content navigation interfaces **512**, the custom update interface **508** and/or the bookmarks interface **510**. In some examples, the home interface **506** includes one of the other interfaces **508-512** by default depending on preference settings of the corresponding user record. The custom update interface **508** presents entries that are updated in real-time based on preferences set in the corresponding user record. The bookmarks interface **510** presents saved previous query results **102**.

In the illustrated example, the content navigation interfaces **512** includes a text-based query interface **516**, a map geometry query interface **518**, a map query interface **520**, and an augmented reality query interface **522**. The text-based query interface **516** facilitates a user generating a query **104** by entering a string into a text box. For example, a user may enter "The Thompson Center" into the text box of the text-based query interface **516**. As disclosed in more detail in FIG. **9** below, the map geometry query interface **518** provides an interface to (i) generate queries based on interactive map geometry data (e.g., from a map geometry content database provider, such as Google, CycloMedia, Tencent, etc.) and/or static images, and (ii) browse results from the queries. As disclosed in more detail in FIG. **10**, the map query interface **520** provides an interface to (i) generate queries based on map images, and (ii) browse results from the queries. As disclosed in more detail below in FIG. **11**, the augmented reality query interface **522** provides an interface to (i) generate queries based on pointing a camera (e.g., the back-facing camera **2616** of FIG. **26** below) at objects, (ii) provide quick results based on identifying the objects, and (iii) browse results from the queries.

The viewport **514** is the visible area of the interfaces **502-512** on the end-user devices **106**. Because the displays (e.g., the display **2612** of FIG. **26** below), and thus the amount of area to provide the interface to the user, of the different types of end-user devices **106** have different dimensions, the viewport **514** varies how the interfaces are displayed on the particular end-user device **106**. For example, the displayed interfaces **502-512** may be smaller, oriented differently, and/or have a different aspect ratio on a portable device (e.g., a smart phone, a tablet, etc.) than on a computer screen. In the illustrated example, the viewport **514** formats the orientation, layout, and size to the interfaces **502-512** suitable for the particular display of the end-user device **106**.

FIG. **6** depicts an interface **600** presented by the end-user device **106** of FIG. **1** to facilitate presenting and interacting with the query results **102**. In some examples, the interface **600** is superimposed on the interface **516-522** from which the query **104** was generated. For example, if the query **104** was generated via the map geometry query interface **518**, the interface **600** maybe superimposed on the image of the map geometry data of the map geometry query interface **518**. In the illustrated example, the interface **600** includes a query identifier field **602**, query result fields **604**, a scrubber track **606**, event points **608**, timeline markers **610**, a scrubber **612**, and a position marker **614**. The example query identifier field **602** displays the query **104** for which the query results **102** are being displayed. The query result fields **604** display the query results **102** segregated by topic and/or content database provider **108**. In some examples, the query result fields **604** are sized according to a number of entries associated with the corresponding topic and/or content database provider **108**. In some examples, when there are more entries for a topic and/or content database provider **108** than can be displayed in the corresponding query result field **604**, the interface **600** accepts a swipe input (e.g., a vertical or horizontal input to the particular query result fields **604**) to facilitate browsing the entries displayed in the particular query result fields **604**.

The scrubber track **606** facilitates limiting results displayed in the query result fields **604** by a criterion. In some examples, the criterion is a chronological value (e.g., a date) associated with the entries in the query result **102**. Alternatively, in some examples, the criterion is a relevancy score associated with the entries in the query result **102**. The scrubber track **606** may be displayed vertically or horizontally. The event points **608** demark events or time periods of significance. In some examples, the events or the time periods of significance are (a) the events or time periods that are location maxima of mentions in the entries of the query results, and/or (b) a curate set of events associated with the particular query **104**. For example, if the query is "Chicago," the event points **608** may mark 1803 (the founding of Fort Dearborn), 1871 (the great Chicago fire), 1893 (the Columbian Exposition World's Fair), 1933 (the Century of Progress World's Fair), and/or 1973 (Sears Tower complete), etc. The timeline markers **610** mark points in time (e.g., day, weeks, years, decades, etc.) depending on the chronological scope of the query. For example, the timeline markers **610** may mark every fifty years.

The scrubber **612** indicates which of the entries are displayed in the query result fields **604**. The scrubber **612** shows a relative amount of entries that are being displayed in the query result fields **604**. For example, if there are **2000** entries and **400** entries are being shown, the scrubber **612** would encompass twenty percent of the scrubber track **606**. In some examples, the size of the scrubber **612** is determined by a user preference for (i) a number of the entries displayed in the query result fields **604** or (ii) a percentage of entries displayed in the query result fields **604**. The position marker **614** controls the position of the scrubber **612**. Changing the location of the position marker **614** along the scrubber track **606** changes at least some of the entries displayed in the query result fields **604**.

FIG. **7** depicts another interface **700** presented by the end-user device **106** of FIG. **1** to facilitate presenting and interacting with the query results **102**. In the illustrated example, the interface **700** presents the query results **102** in a hierarchical manner. In some examples, the interface **700** is superimposed on the interface **516-522** from which the query **104** was generated. The example interface **700** presents a first hierarchy element **702** that displays a first level of results. In some examples, the first level of results is the content database providers **108**. When one of the first levels of results is selected, the interface presents a second hierarchy element **704** that displays a second level of results. In some examples, the second level of results is the topics associated with the query **104**. When one of the second levels of results is selected, the interface **700** displays a third hierarchy element **706** that displays a third level of results. In some examples, the third level of results includes the entries from the selected content database provider about the selected topic. In some examples, the interface **700** may include further hierarchical levels to facilitate browsing the query results **102** in finer levels of detail. In the illustrated example, the interface **700** includes the scrubber track **606**, the event points **608**, the timeline markers **610**, the scrubber **612**, and/or the position marker **614** to facilitate navigating though the query results **102** based on the criterion (e.g., the chronological value, the relevance value, etc.).

FIG. **8** depicts another interface **800** presented by the end-user device **106** of FIG. **1** to facilitate presenting and interacting with the query results **102**. In the illustrated example, the interface includes the first hierarchy element **702**, the second hierarchy element **704**, and the third hierarchy element **706** arranged in concentric circles. In the illustrated example, the first hierarchy element **702** is associated with the topic, the second hierarchy element **704** is associated with the content database providers **108**, and the third hierarchy element **706** is associated with the entries. Initially, some of the hierarchies **704** and **706** are hidden until a selection is made on the associated lower level hierarchy (e.g., the first hierarchy element **702**). In some examples, the interface **800** includes more hierarchies. In such examples, at the hierarchies closer to the center are more general and the hierarchies become more specific the further from the center they are. An example hierarchy may be: topic→content providers→entry types→specific entries. In some examples, a user scrolls through the hierarchies **702-706** by turning the hierarchy of interest about a central axis. Although not shown, the interface **800** may include the scrubber track **606**, the event points **608**, the timeline markers **610**, the scrubber **612**, and/or the position marker **614** to facilitate navigating though the query results based on the criterion (e.g., the chronological value, the relevance value, etc.).

FIG. **9** depicts the map geometry query interface **518** presented by the end-user device **106** of FIG. **1** to facilitate generating the query **104** and presenting and interacting with the query results **102**. In the illustrated example, the user browses map geometry data and/or static images to generate the query **104**. Based on the displayed map geometry data or the static image, the end-user device **106** sends pre-query data to the ARPE **100** to identify objects **900** (e.g., buildings, landmarks, people, etc.) in the map geometry data or the static image. In the illustrated example, the map geometry query interface **518** outlines the identified objects. When the user interacts with the highlighted object (e.g., the object **900**), the map geometry query interface **518** generates a query **104** about that object.

Initially, in some examples, the map geometry query interface **518** may display a zoomed-out view of an overhead map of the area around the location of the end-user device **106**. The user may set a preference for how much the initial view of the overhead map is zoomed-out. The user selects a location on the overhead map to view the map geometry data. In the illustrated example, the map geometry query interface **518** includes an inset map **902** that shows (a)

the location of the point-of-view on the overhead map and (b) the orientation of the point-of-view of currently displayed map geometry data in comparison to the overhead map. The map geometry query interface **518** may also include other windows to display information about the displayed map geometry data. When the end-user device **106** receive results from the ARPE **100**, the map geometry query interface **518** displays the results in via an interface (e.g., the interfaces **600**, **700**, and **800** of FIGS. **6**, **7**, and **8** above) super imposed on the map geometry query interface **518**. In the illustrated example, the map geometry query interface **518** includes results display via the hierarchical interface **700** of FIG. **7** above. In the illustrated example, windows (e.g., the hierarchy elements **702**, **704**, and **706**, the inset map **902**, a query text box **904**, etc.) displayed by the map geometry query interface **518** include handles **906** that facilitate hiding and expanding the windows. In some examples, to hide one of the windows, the corresponding handle **906** is dragged to an edge of the map geometry query interface **518**. In some examples, double-tapping the handles **906** causes the corresponding window (e.g., the inset map **902**) to collapse or expand. In some examples, event points **608** are added to the scrubber track **606** to indicate entries (e.g., images, videos, etc.) of the scene displayed by the map geometry query interface **518** are available that represent a different point in time.

In some examples, the end-user device **106** includes an accelerometer and a magnetometer to facilitate determining the orientation of the end-user device **106**. In some such examples, when the map geometry data is displayed, changing the orientation of the end-user device **106** changes which portion of the map geometry data is displayed. In such a manner, the user may change the map geometry data by moving the end-user device **106**. In such examples, as the displayed map geometry data changes, the end-user device **106** sends pre-query data to the ARPE **100** to identify the objects **900** in the displayed map geometry data or the static image. The map geometry query interface **518** continually identifies (via the pre-query responses) and outlines the objects **900**.

FIG. **10** depicts the map query interface **520** presented by the end-user device **106** of FIG. **1** to facilitate generating the query **104** and presenting and interacting with the query results **102**. In the illustrated example, the map query interface **520** displays a map **1000**. The map **1000** may be selected via one of the result interface (e.g., interfaces **600**, **700**, and **800** of FIGS. **6**, **7**, and **8**, above). The map query interface **520** includes the scrubber track **606**, the event points **608**, the timeline markers **610**, the scrubber **612**, and/or the position marker **614** to facilitate navigating though related maps (e.g., maps that cover the same or substantially similar geographical areas, etc.) with different chronological values. The event points **608** are indicative of maps with different chronological values. The illustrated example includes a trackhead menu **1004** to display the map(s) associated with the event point **608** at which the position marker **614** is located. In some examples, the trackhead menu **1004** presents a string list to facilitate selecting different maps associated with the event point **608**.

The map query interface **520** includes highlighted regions **1002** to indicate suggested queries **104**. For example, a map that depicts Chicago in 1893 may include a highlighted region **1002** around the area of the map of the World's Columbian Exposition. When one of the highlighted regions **1002** is selected, the map query interface **520** generates a query **104** associated with the topic of the corresponding highlighted region **1002**. The query results **102** may be superimposed on the map query interface **520** using one of the result interfaces **600**, **700**, and **800**. In some examples, the map query interface **520** includes a view distance control panel **1006** that facilitates increasing and decreasing the magnification or zoom of the map **1000**. In some such examples, if the user set a view distance to show regions beyond the borders of the map **1000**, the map query interface **520** display (a) other maps that have a similar chronological value and/or (b) current maps (such as satellite imagery maps, roadmaps, etc.).

FIG. **11** depicts an augmented reality query interface **522** presented by the end-user device **106** of FIG. **1** to facilitate generating the query **104** and presenting and interacting with the query results **102**. In the illustrated example, the augmented reality query interface **522** displays a live image **1102** captured by one of the cameras (e.g., the cameras **2614** and **2616** of FIG. **26** below). Additionally or alternatively, in some examples, the augmented reality query interface **522** displays images from a media application (e.g., Netflix, Hulu, local broadcasts via a smart TV, etc.) as if the images were being captured by one of the cameras. In some examples, when the augmented reality query interface **522** is described below as analyzing the live images captured by one of the cameras, the augmented reality query interface **522** may instead be analyzing images from the media application. From time-to-time (e.g., periodically, aperiodically, etc.), the augmented reality query interface **522** sends pre-query data to the ARPE **100** to identify objects **1104** within the live image **1102**. The information in the pre-query data depends on the sensors of the end-user device **106**. When an object **1104** is recognized, the augmented reality query interface **522** outlines and/or highlights the object **1104**. In some examples, when an object **1104** is recognized, the ARPE **100** performs abbreviated queries with the objects **1104** as topics. In such an example, the augmented reality query interface **522** displays abbreviated query panels **1106** with basic information (e.g., identity of the object, dates associated with the object, number of entries pertaining to the object, factoids about the object, available subscriptions to content database providers **108** with information about the object, etc.). When the user interacts with the outlined and/or highlighted area or the abbreviated query panels **1106**, the augmented reality query interface **522** generates and sends the query **104** with the identity of the object as the topic to the ARPE **100**.

When the augmented reality query interface **522** receives the query results **102**, the augmented reality query interface **522** may super impose the query results based on the results interface (e.g., the interfaces **600**, **700**, and **800** of FIGS. **6**, **7**, and **8** above). Additionally, in some examples, in response to an entry from the query results **102** being selected, the augmented reality query interface **522** super imposes the selected entry onto the live image **1102**. For example, if the selected entry is an image associated with coordinates and an orientation, the augmented reality query interface **522** may transform (e.g. change size, display angle, and/or perspective, etc.) the image to display in the place of the corresponding object **1104**. In some examples, the augmented reality query interface **522** emphasizes local entries (e.g., related to topics that are geographically proximate to the location of the end-user device **106**).

Additionally, in some examples, the augmented reality query interface **522** facilities generating entries to be associated with the outlined and/or highlighted the objects **1104**. In such an example, the user, via an input device (e.g., the input devices **2608** of FIG. **26** below) enters a message (e.g., a length limited message) to be pinned to (e.g., associated in

the ARP database **112** with) the selected outlined and/or highlighted the object **1104** and associated with a date. Additionally, the augmented reality query interface **522** may receive the message as part of the pre-query data and present (e.g., via one of the interfaces **600**, **700**, and **800**) the pinned messages when the corresponding object **1104** is outlined and/or highlighted.

FIG. **12** is a block diagram of the database sorter **110** of FIG. **1** that generates the entry records **1200** (e.g., based on the entry record data structures **200** of FIG. **2**). In the illustrated example, the database sorter **110** includes an example content scanner **1202**, an example image identifier **1204**, an example content tagger **1206**, and an example record creator **1208**.

The example content scanner **1202** receives entries **1210** from the content database providers **108**. The content scanner **1202** forwards ones of the entries **1210** that are images to the example image identifier **1204**. The content scanner **1202** analyzes the entries **1210** to identify topics of interest within the entries **1210**. The content scanner **1202** analyzes the body of the entry **1210**, the title of the entry **1210**, and metadata (e.g., tags, author, dates, etc.), etc. In the illustrated example, the database sorter **110** maintains an example topic database **1212** that includes topics on interest to be identified by the content scanner **1202**. In some examples, the topic database **1212** includes abbreviations and common misspellings of the topics of interest. In some examples, the content scanner **1202** analyzes the entries to determine potential topics that are not in the topic database **1212**. The potential topics are words in sentences that may be the subject or object of the sentence. In some such example, the potential topics may be flagged to determine whether the topic should be added to the topic database **1212**. For example, if the entry **1210** states "The dogtor prescribed medicine to my corgi," the content scanner **1202** may (a) identify {medicine, corgi} as the topics of the entry **1210**, and (b) {dogtor} as a potential topic. In some examples, when the entry **1210** does not have a text body (e.g., is a video, an augmented reality experience, etc.), the content scanner **1202** identifies topics in the metadata of the entry **1210** which may include topics suggested by the corresponding content database provider **108**. Additionally, the content scanner **1202** analyzes the entries **1210** to identify dates associated with the entries. For example, an entry **1210** written on Apr. 4, 2008 that discusses the battle at Gettysburg may be associated with that dates of {Jul 1, 1863, Jul. 1, 1863, Jul. 1, 1863, Apr. 4, 2008}.

The image identifier **1204** identifies topics within the entries **1210** that include images. The image identifier **1204** analyzes the metadata (e.g., HTML data, the EXIF data, the XMP data, etc.) associated with the image to determine tags of topics associated with the image. For example, the XMP data associated with the image may include keywords, key phrases, location markers, coordinates, or classification codes that describe the topic(s) of the image. In some example, the image identifier **1204** uses machine learning techniques (such as neural networks, etc.) to performs image recognition to identify topics in the image. Additionally, in some examples, the image identifier **1204** performs facial recognition to identify people in the image. In some examples, the image identifier **1204** performs a reverse image lookup to (i) identify other entries in which the image is used and/or (ii) identify other copies of the image that may contain different metadata. In some such examples, the image identifier **1204** identifies topics within the image based on the topics in the other associated entries and/or images. In some such examples, the topics are weighted based on the source (e.g., the content database provider **108**) of the other associated entries and/or images. For example, the image identifier **1204** may distinguish between professional sources (e.g., professional image providers, such as Getty® Images, newspapers, etc.) and crowdsourced sources (e.g., Wikipedia, Amazon Turk, etc.).

The example content tagger **1206** associates the topics in the entries **1210** identified by the content scanner **1202** and/or the image identifier **1204** with topic identifiers for the topic ID field **206**. In the illustrated example, the content tagger **1206** uses a synonym database **1214**. The synonym database **1214** (a) associates topics that are synonyms, and (b) associates the topic identifiers with topics identified by the content scanner **1202** and/or the image identifier **1204**. For example, the topics of {Abraham Lincoln, Honest Abe, Uncle Abe, The Great Emancipator, the Illinois Rail Splitter} may be associated with the topic identifier {713589}. In some examples, the content tagger **1206** includes the identified topic identifier(s) in the topic ID field **206** for a particular entry record if a number of times the topic or one of its synonyms is identified in the entry **1210** satisfies (e.g., is greater than or equal to) a threshold. In some such examples, the threshold is based on a number of topics identified in the entry **1210**. For example, if thirty-five topics are identified in the entry **1210**, the threshold may be five. Additionally, in some examples, the content tagger **1206** calculates relevance scores for the topics to be associated with the entry **1210**. The relevance score measures the importance of the topic to the entry **1210**. For example, the relevance score for text-based entries **1210** may be based on (i) the frequency of the topic in entry **1210**, (ii) the length of the entry **1210**, and (iii) the number of entries that **1210** that contain the topic.

The example record creator **1208** creates the entry records **1200** based on the entry record data structures **200**. The record creator **1208** generates a unique record identifier to be entered into the record ID field **202**. The record creator **1208** enters an identifier associated with the corresponding content database provider **108** in the CDP ID field **204**. Additionally, the record creator **1208** enters the topic identifiers identified by the content tagger **1206** into the topic ID field **206**. The record creator **1208** enters metadata associated with the entry **1210** (e.g., the title, coordinates, the author, the file size, etc.) into the topic metadata field **208**. In some examples, the record creator **1208** maintains a metadata database **1216** that includes information (e.g., coordinates associated with a topic, dates associated with a topic, etc.) about the topics that may not be included in the entry **1210**. The record creator **1208** enters dates associated with the topic identified by the content scanner **1202** and/or the image identifier **1204** or included in the metadata database **1216** into the topic date field **210**. The record creator **1208** enters the URI associated with the entry **1210** into the URI field **212**. The record creator **1208** then stores the entry record **1200** into the ARP database **112**.

FIG. **13** is a block diagram of the query responder **120** of the augmented reality platform entity **100** of FIG. **1**. In the illustrated example, the query responder **120** includes an example query response generator **1300**, an example query organizer **1302**, and an example reply generator **1304**.

The example query response generator **1300** receives the query **104** from the end-user device **106** via the session handler **118**. The query response generator **1300** analyzes the query **104** to determine the topic(s) contained in the query **104**. In some examples, because some topics may not be directly contained in the query **104** (e.g., are inferential), the query response generator **1300** determines some topics

based on inferences to other topics contained in the query **104**. For example, if the query data field **306** of the query include the text string "person who designed the rookery building," the query response generator **1300** may retrieve people-related topics from the topic database that are related to the topic of the "Rookery Building." Based on the topics, the query response generator **1300** determines which topics in the topic database **1212** are related (e.g., have affinity with) the topics of the query **104**.

The example query organizer **1302** receives and/or otherwise retrieves the topics identified by the query response generator **1300**. Based on the topics, the query organizer **1302** retrieves the entry records **1200** related to the topics from the ARP database **112**. In some examples, the entry records **1200** are filtered based on (i) the relevance of the entry records **1200** to the identified topics, and (ii) relationship between the identified topics and the query **104**.

The example reply generator **1304** generates the query results **102** based on the entry records **1200** received and filtered by the query organizer **1302**. Based on user preferences stored in the user database **116**, the reply generator **1304** filters and orders the entry records **1200** based on the preferences. For example, a first user may prefer entries be presented by topic and then database content provider **108** or vice versa. In some examples, the reply generator **1304** assigns the records into chronological categories that are associated with periods of time. In some such examples, the chronological categories are based on a number of dates associated with the entry records **1200** in the query results **102** and clustering of the dates. Additionally, in some examples, the reply generator **1304** organizes the entry records **1200** into the chronological categories. In such examples, the reply generator **1304** organizes the entry records **1200** in each of the chronological categories into hierarchies (e.g., the hierarchies **702**, **704**, and **706** of FIG. **7** above). The reply generator **1304** formats (e.g., in HTML, in XML, etc.) the organized entry records **1200** to generate the query results **102**.

FIG. **14** is a block diagram of a query generator **1400** of the end-user device **106** of FIG. **1**. The query generator **1400** generates queries **104** based on input from the end-user device **106** (e.g. via the input devices **2608** and/or the cameras **2614** and **2616** of FIG. **26** below) and presents the query results **102** via a display (e.g., the display **2612** of FIG. **26** below). In some examples, the query generator **1400** is included in an application that is downloaded onto the end-user device **106** from an application store (e.g., the Google Play Store, the App Store, etc.). Alternatively, in some examples, the query generator **1400** is implemented in hardware and software. In the illustrated example, the query generator **1400** includes an example query selector **1402**, an example query formatter **1404**, and an example result presenter **1406**.

The query selector **1402** presents an interface (e.g., one of the interfaces **502-512**) to the user on a display (e.g., the display **2612** of FIG. **26** below). The query selector **1402** receives input (e.g., from the input devices **2608** and/or the cameras **2614** and **2616** of FIG. **26** below) to facilitate a user navigating between the interfaces **502-512** and the user selecting which one of the content navigation interfaces **512** to generate a query **104**.

The query formatter **1404** receives input to determine the query of the user based on the content navigation interfaces **512** selected via the query selector **1402**. For some interfaces (e.g., the map geometry query interface **518**, the map query interface **520**, the augmented reality query interface **522**, etc.), the query formatter **1404** generates pre-query data **1408** to be sent to the ARPE **100** to provide context to the selected interface. The pre-query data **1408** provides context to the ARPE **100** about the location and environment of the end-user device **106**. For example, the pre-query data **1408** may include GPS coordinates, direction heading, airspeed, and altitude to provide context for objects of interest around when the end-user device **106** is used on a plane. The type of information included in the pre-query data **1408** may be based on the interface **512** being used. For example, for the augmented reality query interface **522**, the query formatter **1404** may generate pre-query data **1408** that includes image (s) captured by the camera(s) of the end-user device **106**. Additionally, the query formatter **1404** based on input from a user and, in some example, a pre-query response **1410**, the query formatter **1404** generates the query **104**.

The result presenter **1406** receives the query results **102** and, in some examples, the pre-query response **1410**. The result presenter **1406** superimposes the query results **102** onto the interface selected via the query selector **1402**. In some examples, in response to receiving the pre-query response **1410**, the result presenter **1406** superimposes outlines and/or highlights of topics of interest contained in the pre-query response **1410** on the interface selected via the query selector **1402**. For example, if the pre-query response **1410** includes data for a particular tombstone from an image in the pre-query data **1408**, the result presenter **1406** superimposes an outline and/or a highlight the tombstone in the interface being displayed to the user.

FIG. **15** is a flowchart of a method to index entries **1210** from content database providers **108**, which may be implemented by the processor platform of FIG. **25**. Initially, at block **1502**, the content scanner **1202** receives an entry **1210** from one of the content database providers **108**. At block **1504**, the content scanner **1202** determines whether the entry **1210** received at block **1502** is an image. If the entry **1210** is an image, the method continues at block **1506**. Otherwise, if the entry **1210** is not an image, the method continues at block **1508**.

At block **1506**, the image identifier **1204** analyzes the image to determine the topics in the image. The image identifier **1204** evaluates the metadata of the image for tags that identify the topics depicted by the image. In some examples, the image identifier **1204** performs image recognition on the image to identify the topics depicted by the image. At block **1508**, the content scanner **1202** analyzes the text and metadata associated with the entry **1210** to determine the topics of interest in the entry **1210**. At block **1510**, the content tagger **1206** tags the identified topics identified by the content scanner **1202** and/or the image identifier **1204**. In some examples, based on the synonym database, the content tagger **1206** consolidates the topics identified by the content scanner **1202** and/or the image identifier **1204**. Additionally, at block **1512**, the content tagger **1206** identifies dates associated with the entry and/or calculates a relevance score for each of the identified topics. At block **1514**, the record creator **1208** creates an entry record **1200** for the entry **1210** including the content database provider **108**, the identified topics, the identified dates, the URI, and identifying metadata. At block **1516**, the record creator **1208** stores the entry record **1200** in the ARP database **112**.

The flowchart of FIG. **15** is representative of machine readable instructions stored in memory (such as the memory **2504** of FIG. **25** below) that comprise one or more programs that, when executed by a processor (such as the processor **2502** of FIG. **25** below), cause the ARPE **100** to implement the example query responder **120** of FIGS. **1** and **13**. Further, although the example program(s) is/are described with ref-

erence to the flowchart illustrated in FIG. **15**, many other methods of implementing the example query responder **120** may alternatively be used. For example, the order of execution of the blocks may be changed, and/or some of the blocks described may be changed, eliminated, or combined.

FIG. **16** is a flowchart of a method to generate the queries **104** and present the query results **102**, which may be implemented by the electronic components of FIG. **26**. Initially, at block **1602**, the query selector **1402** displays a text query bar and query options via the home interface **506**. At block **1604**, the query selector waits until a type of query has been selected. At block **1606**, the query selector **1402** displays the selected interface (e.g., one of the interfaces **516-522**). At block **1608**, the query selector **1402** waits until the user enters (e.g., enters text into a text box, selects an identified object on map geometry data, selects a point of interest on a map, selects an object identified in a live image, etc.). At block **1610**, the query formatter **1404** generates the query **104** and sends the query **104** to the ARPE **100**. At block **1612**, the result presenter **1406** receives query results **102** from the ARPE **100**. At block **1614**, the result presenter **1406** displays the query results **102**. Example methods to display the query results are disclosed in FIGS. **18-22** below.

FIG. **17** is a flowchart of a method to present the query results **102**, which may be implemented by the electronic components of FIG. **26**. Initially, at block **1702**, the result presenter **1406** displays the scrubber track **606** with event points **608** and/or timeline markers **610**. The location of the event points **608** along the scrubber track **606** are based on dates associated with the query results **102**. For example, the event points **608** may represent a number (e.g., five, ten, twenty, etc.) of the most reoccurring dates within the query results **102**. For example, if the query results **102** are based on the topic "the battle of Gettysburg," a first event point **608** may represent Jul. 1, 1863, a second event point **608** may represent Jul. 2, 1863, a third event point **608** may represent Jul. 3, 1863, and a fourth event point **608** may represent Oct. 19, 1863. In some examples, the result presenter **1406** displays the timeline markers **610** based on the earliest date and the latest date associated with the query results **102**. In some such example, the timeline markers **610** are displayed linearly. Alternatively, in some examples, the timeline markers **610** are displayed logarithmically.

At block **1704**, the result presenter **1406** displays the scrubber **612** to indicate scope of currently displayed results. For example, if twenty percent of the results from the query results **102** are displayed, then the scrubber **612** may occupy twenty percent of the length of the scrubber track **606**. At block **1706**, the result presenter **1406** displays the position marker **614** used to modify the location of the scrubber **612** on the scrubber track **606** which changes of currently displayed results.

At block **1708**, the result presenter **1406** selects the next content database provider **108** (as identified by the CDP ID filed **204**) identified in the query results **102**. At block **1710**, the result presenter **1406** sizes the query result field **604** corresponding to the selected content database provider **108** based on the number of entries associated with the content database provider **108** within the scope of currently displayed results (as selected via the scrubber **612**). At block **1712**, the result presenter **1406** displays the entries within the corresponding query result field **604** associated with (a) the selected content database provider **108** and (b) the current scope as indicated by the scrubber **612**. At block **1714**, the result presenter **1406** determines whether there is another content database provider **108** to display within the query results **102**. If there is another content database provider **108** to display, the method returns to block **1708**. Otherwise, if there is not another content database provider **108** to display, the method continues to block **1716**.

At block **1716**, the result presenter **1406** determines whether it received input to change which portion of the results are displayed in one of the category boxes. For example, the end-user device **106** with a touch screen may receive a vertical swiping motion within an area of one of the query result fields **604**. If input is received, the method continues to block **1718**. Otherwise, if the input is not received, the method continues to block **1720**. At block **1718**, the result presenter **1406** changes which of the entries are displayed in the query result field **604** associated with the input. At block **1720**, the result presenter **1406** determines whether it received input to change the position of the scrubber **612**. If the input is received, the method returns to block **1708**. Otherwise, if the input is not receivers, the method returns to block **1716**.

FIG. **18** is a flowchart of a method to present the query results **102**, which may be implemented by the electronic components of FIG. **26**. Initially, at block **1802**, the result presenter **1406** displays the scrubber track **606** with event points **608** and/or timeline markers **610**. The location of the event points **608** along the scrubber track **606** are based on dates associated with the query results **102**. In some examples, the result presenter **1406** displays the timeline markers **610** based on the earliest date and the latest date associated with the query results **102**. In some such example, the timeline markers **610** are displayed linearly. Alternatively, in some examples, the timeline markers **610** are displayed logarithmically.

At block **1804**, the result presenter **1406** displays the scrubber **612** to indicate scope of currently displayed results. For example, if twenty percent of the results from the query results **102** are displayed, then the scrubber **612** may occupy twenty percent of the length of the scrubber track **606**. At block **1806**, the result presenter **1406** displays the position marker **614** used to modify the location of the scrubber **612** on the scrubber track **606** which changes of currently displayed results.

At block **1808**, the result presenter **1406** displays, in the first hierarchy element **702**, a first group associating content database providers **108** with numbers of entries that (a) are associated with the content database provider **108** and (b) are within the scope indicated by the scrubber **612**. At block **1810**, the result presenter **1406** determines whether it has received a selection of one of the content database provider **108**. If a selection has been received, the method continues at block **1812**. Otherwise, if a selection has not been received, the method continues at block **1818**. At block **1812**, the result presenter **1406** displays, in the second hierarchy element **704**, a second group associating topics in the query results **102** corresponding to the selected content database provider **108** with a number of entries that are associated with topics with the scope indicated by the scrubber **612**. At block **1814**, the result presenter **1406** determines whether it has received a selection of one of the topics in the second hierarchy element **704**. If a selection has been received, the method continues at block **1816**. Otherwise, if a selection has not been received, the method continues at block **1818**. At block **1816**, the result presenter **1406**, in the third hierarchy element **706**, displays a third group with the entries associated with the selected topic separated by type (e.g., articles, maps, images, videos, augmented reality experiences, map geometry data, etc.).

At block **1818**, the result presenter **1406** determines whether the input has been received to change the position

of the scrubber **612**. If input has been received, the method continues to block **1820**. Otherwise, if input has not been received, the method returns to block **1810**. At block **1820**, the result presenter **1406** changes the first group displaying the content database providers **108** in the first hierarchy element **702**, the second group displaying the topics in the second hierarchy element **704**, and/or the third group displaying the entries in the third hierarchy field **706** to display results associated with the scope indicated by the scrubber **612**.

FIG. **19** is a flowchart of a method to present the query results **102**, which may be implemented by the electronic components of FIG. **26**. Initially, at block **1902**, the result presenter **1406** displays the scrubber track **606** with event points **608** and/or timeline markers **610**. The location of the event points **608** along the scrubber track **606** are based on dates associated with the query results **102**. In some examples, the result presenter **1406** displays the timeline markers **610** based on the earliest date and the latest date associated with the query results **102**. In some such example, the timeline markers **610** are displayed linearly. Alternatively, in some examples, the timeline markers **610** are displayed logarithmically.

At block **1904**, the result presenter **1406** displays the scrubber **612** to indicate scope of currently displayed results. For example, if twenty percent of the results from the query results **102** are displayed, then the scrubber **612** may occupy twenty percent of the length of the scrubber track **606**. At block **1906**, the result presenter **1406** displays the position marker **614** used to modify the location of the scrubber **612** on the scrubber track **606** which changes of currently displayed results.

At block **1908**, the result presenter **1406** displays, the first hierarchy element **702** shaped as a circle or polygon, one of the topics related to the query **104**. In some examples, the result presenter **1406** displays multiple first hierarchy elements **702**, which may be moveable, resizable and/or hidable, etc., for the different ones of the topics related to the query **104**. For example, if the query **104** is "The Rookery Building," a first one of the first hierarchy elements **702** may be associated with "The Rookery Building" and a second one of the first hierarchy elements **702** may be associated with "Daniel Burnham."

At block **1910**, the result presenter **1406** displays, on the second hierarchy element **704** shaped as a first ring around the first hierarchy element **702**, the content database providers **108** associated with entries corresponding to the topic that are within the scope indicated by the scrubber **612**. At block **1912**, the result presenter **1406** determines whether a selection of one content database providers **108** has been received. If a selection has been received, the method continues to block **1914**. Otherwise, if a selection has not been received, the method continues to block **1916**.

At block **1914**, the result presenter **1406** displays, on the third hierarchy element **706** shaped as a first ring around the second hierarchy element **704**, display entries associated with the selected content database provider **108** that are within the scope indicated by the scrubber **612**. At block **1916**, the result presenter **1406** determines whether the input has been received to change the position of the scrubber **612**. If input has been received, the method continues to block **1918**. Otherwise, if input has not been received, the method returns to block **1912**. At block **1918**, the result presenter **1406** changes the content database providers **108** in the second hierarchy element **704** and/or the entries in the third hierarchy element **706** to display entries associated with the scope indicated by the scrubber **612**.

FIG. **20** is a flowchart of a method to present the query results **102** in conjunction with map geometry data, which may be implemented by the electronic components of FIG. **26**. Initially, at block **2002**, the query selector **1402** displays the map geometry. The map geometry includes images that may be planned to illustrate a geographical location as if the user of the end-user device **106** was at that location. At block **2004**, the query selector **1402** displays an inset map **902** indicating the orientation of the displayed map geometry. At block **2006**, the query formatter **1404** sends pre-query data **1408** to the ARPE **100**. In some examples, the pre-query data **1408** includes an image being displayed, coordinates from which the map geometry data was captured, and the angle at which the map geometry data is being viewed. At block **2008**, the query selector **1402** outlines places or things in the displayed at block **2002** recognized in the map geometry data. At block **2010**, the query selector **1402** determines whether it has received a selection of one of the places or things outlines at block **2008**. If a selection has been received, the method continues at block **2012**. Otherwise, if a selection has not been received, the method continues at block **2016**.

At block **2012**, the query formatter **1404** sends the query **104** to the ARPE **100** with the selected place or thing in the query data field **306**. At block **2014**, the result presenter **1406** displays the query results **102** received from the ARPE **100**. Examples methods of displaying the query results **102** are disclosed in FIGS. **17**, **18**, and **19** above. At block **2016**, the query selector **1402** determines whether it has received input to change the displayed map geometry data. If the input to change the displayed map geometry data has been received, the method returns to block **2002**. Otherwise, if the input to change the displayed map geometry data has not been received, the method returns to block **2010**.

FIG. **21** a flowchart of a method to present the query results **102** in conjunction with map data, which may be implemented by the electronic components of FIG. **26**. Initially, at block **2102**, the query selector **1402** displays a map retrieved via a query **104**. For example, one of the entries include in query results **102** may be a map **1000**. At block **2104**, the query selector **1402** displays event points **608** along the scrubber track **606** indicating other related maps. For example, if the displayed map **1000** is a map of Chicago from 1893, the query selector **1402** may display event points **608** along the scrubber track **606** indicating maps of Chicago associated with other dates. At block **2106**, the query selector **1402** determines whether the displayed map **1000** is associated with locations of interest. In some examples, the information (e.g., boundaries on the map, related topics, etc.) about the locations of interest is included in the map data. If there are locations of interest associated with the displayed map **1000**, the method continues at block **2108**. Otherwise, if there are not locations of interest associated with the displayed map **1000**, the method continues to block **2116**.

At block **2108**, the query selector **1402** highlights locations of interest on the map **1000** (e.g., the highlighted regions **1002** of FIG. **10**). At block **2110**, the query selector **1402** determines whether one of the locations of interest has been selected. If one of the locations of interest has been selected, the method continues at block **2112**. Otherwise, if one of the locations of interest has not been selected, the method continues at block **2116**. At block **2112**, the query formatter **1404** sends a query **104** to the ARPE **100** with location of interest in the query data field **306**. At block **2114**, the result presenter **1406** displays the query results **102** received from the ARPE **100**. Examples methods of display-

ing the query results **102** are disclosed in FIGS. **17**, **18**, and **19** above. At block **2116**, the query selector **1402** determines whether the position of the position marker **614** changed. If the position of the position marker **614** changed, the method continues to block **2118**. Otherwise, if the position of the position marker **614** did not change, the method returns to block **2110**. At block **2118**, the query selector **1402** displays a map **1000** associated with position of the position marker **614**.

FIG. **22** a flowchart of a method to present the query results **102** in conjunction with live image data from a camera (e.g., the camera **2614** and **2616** of FIG. **26** below), which may be implemented by the electronic components of FIG. **26**. Initially, at block **2202**, the query selector **1402** displays the image captured by the camera. At block **2204**, the query formatter **1404** sends pre-query data **1408** to the ARPE **100**. In some examples, the pre-query data includes the image captured by the camera, the coordinates of the end-user device **106**, the orientation of the camera, and/or the field of view of the camera, etc. At block **2206**, the query selector **1402** outlines places or things recognized in the image based on a pre-query response **1410** received from the ARPE **100**. At block **2208**, the query selector **1402** determines whether one of the outlined places or things has been selected. If one of the outlined places or things has been selected, the method continues at block **2210**. Otherwise, if one of the outlined places or things has not been selected, the method continues at block **2214**.

At block **2210**, the query formatter **1404** sends a query **104** to the ARPE **100** with the selected place or thing in the query data field **306**. At block **2212**, the result presenter **1406** displays the query results **102** received from the ARPE **100**. Examples methods of displaying the query results **102** are disclosed in FIGS. **17**, **18**, and **19** above. At block **2214**, the query selector **1402** determines whether (a) the image captured by the camera has changed and/or (b) the pose (e.g., coordinates and orientation, etc.) of the camera has changed. If (a) the image captured by the camera has changed and/or (b) the pose of the camera has changed, the method returns to block **2204**. Otherwise, if (a) the image captured by the camera has not changed and/or (b) the pose of the camera has not changed, the method returns to block **2208**.

The flowcharts of FIGS. **16-22**, and **24** are representative of machine readable instructions stored in memory (such as the memory **2604** of FIG. **26**) that comprise one or more programs that, when executed by a processor (such as the processor **2602** of FIG. **26**), cause the end-user device **106** to implement the example query generator **1400** of FIG. **14**. Further, although the example program(s) is/are described with reference to the flowchart illustrated in FIGS. **16-22**, and **24**, many other methods of implementing the example query generator **1400** may alternatively be used. For example, the order of execution of the blocks may be changed, and/or some of the blocks described may be changed, eliminated, or combined.

FIG. **23** illustrates the augmented reality interface **522** of FIG. **11** providing location specific content **2302** superimposed on live images captured by the end-user device **106** of FIG. **1**. The end-user device **106** provides its location to the ARPE **100** (e.g., via the pre-query data **1408**). The ARPE **100** determines whether one of the content database providers **108** associated with a venue (e.g., a stadium, a theater, a museum, etc.) corresponding to the location of the end-user device **106** is providing location specific content **2302**. The location specific content **2302** is content that is being generated in near real-time (e.g., there may be a delay between the creation of the content for processing and/or indexing, etc.) for users located at the venue. For example, the location specific content may be closed captioning of an announcer or a tour guide, etc. In some examples, the ARPE **100** provides the location specific content **2302** via the pre-query response **1410**. In some such examples, as long as enabled, the ARP **100** continuously pushes the location specific content **2302** to the end-user device **106** via the pre-query response **1410**. In such a manner, the venue may provide services to cater to the needs of users while facilitating the users viewing the event or exhibit uninterrupted.

If enabled, the location specific content **2302** is displayed by the augmented reality interface **522** by superimposing the location specific content **2302** on the image being captured by the camera(s) (e.g., the cameras **2614** and **2616** of FIG. **26** below) of the end-user device **106**. In some examples, the location specific content **2302** is displayed on a specific highlighted and/or outlined object **1104**. For example, the location specific content **2302** may be displayed so that it is visible on a scoreboard or jumbotron of a stadium. In the illustrated example, the ARPE **100** (e.g., via the database sorter **110**) provides abbreviated query panels **1106** for topics detected within the location specific content **2302**. When the user interacts with the abbreviated query panels **1106**, the augmented reality query interface **522** generates and sends the query **104** regarding the corresponding topic to the ARPE **100**.

In some examples, the ARPE **100** provides the location specific content **2302** to the end-user device **106** when the end-user device **106** is not located at the venue, but is viewing content (e.g., via a media application) that is generated at the venue. For example, a user may be viewing a baseball game via a media application on a smart TV. In such examples, the augmented reality interface **522** uses the media application as the input (e.g., instead of the images being captured by the camera(s) etc.) and superimposes the location specific content **2302** on the media application.

FIG. **24** is a flowchart of a method to detect and provide location specific content **2302** superimposed on live images captured by the end-user device **106** of FIG. **1**, which may be implemented by the electronic components of FIG. **26**. Initially, at block **2402**, the query formatter **1404** determines the location of the end-user device **106** (e.g., via the GPS receiver **2620** of FIG. **26** below). In some examples, the query formatter **1404** sends pre-query data **1408**. At block **2404**, the query formatter **1404** determines whether the location specific content **2302** is available. In some examples, the query formatter **1404** receives an indication of whether the location specific content **2302** is available in the pre-query response **1410**. If the location specific content **2302** is available, the method continues to block **2406**. Otherwise, is the location specific content **2302** is not available, the method returns to block **2402**.

At block **2406**, the result presenter **1406** presents the augmented reality interface **522** of FIG. **5** on the end-user device **106**. At block **2408**, the query formatter **1404** retrieves or otherwise receives the location specific content **2302**. In some examples, the location specific content **2302** is included in the pre-query responses **1410**. At block **2410**, the result presenter **1406** superimposes the location specific content **2302** onto the image displayed by the end-user device **106**. At block **2412**, the result presenter **1406** determines whether a topic is identified in the location specific content **2302**. If a topic is identified, the method continues at block **2414**. Otherwise, if a topic is not identified, the method continues at block **2416**.

At block **2414**, the result presenter **1406** displays the abbreviated query panels **1106** in associated with the topic

identified in the location specific content **2302**. The information for the abbreviated query panels **1106** is included in the pre-query responses **1410**. At block **2416**, the query formatter **1404** determines whether there is more location specific content **2302**. If there is more location specific content **2302**, the method returns to block **2408**. Otherwise, if there is not more location specific content **2302**, the method returns to block **2402**.

FIG. **25** is a block diagram of an example processor platform **2500** capable of executing the instructions to implement the method of FIG. **15**. The processor platform **2500** can be, for example, a server, a personal computer, a workstation, one or more virtual machines and/or containers, or any other type of computing device. In the illustrated example, the processor platform **2500** includes a processor **2502**, memory **2504**, storage **2506**, input devices **2508**, output devices **2510**, and network devices **2512**.

The processor platform **2500** of the illustrated example includes the processor **2502**. The processor or controller **2502** may be any suitable processing device or set of processing devices such as, but not limited to: a microprocessor, a controller-based platform with multiple processing cores, a suitable integrated circuit, one or more field programmable gate arrays (FPGAs), and/or one or more application-specific integrated circuits (ASICs). In the illustrated example, the processor **2502** is structured to include the example database sorter **110**, the example user handler **114**, the example session handler **118**, and the example query responder **120**.

The memory **2504** may be volatile memory (e.g., RAM, which can include non-volatile RAM, magnetic RAM, ferroelectric RAM, and any other suitable forms); non-volatile memory (e.g., disk memory, FLASH memory, EPROMs, EEPROMs, memristor-based non-volatile solid-state memory, etc.), unalterable memory (e.g., EPROMs), and/or read-only memory. In some examples, the memory **2504** includes multiple kinds of memory, particularly volatile memory and non-volatile memory. The storage **2506** includes high-capacity storage devices, such as hard drives, tape drives, and/or solid state drives, etc. In the illustrated example, the storage **2506** includes the ARP database **112**, the user database **116**, the topic database **1212**, the synonym database **1214**, and/or the metadata database **1216**. When used by the processor **2502**, portions of the databases **112**, **116**, **1212**, **1214**, and **1216** may be move into the memory **2504**, processed by the processor **2502**, and then re-stored in the storage **2506**.

The memory **2504** and storage are computer readable media on which one or more sets of instructions, such as the software for operating the methods of the present disclosure can be embedded. The instructions may embody one or more of the methods or logic as described herein. In a particular embodiment, the instructions may reside completely, or at least partially, within any one or more of the memory **2504**, the storage **2506**, and/or within the processor **2502** during execution of the instructions.

The terms "non-transitory computer-readable medium" and "computer-readable medium" should be understood to include a single medium or multiple media, such as a centralized or distributed database, and/or associated caches and servers that store one or more sets of instructions. The terms "non-transitory computer-readable medium" and "computer-readable medium" also include any tangible medium that is capable of storing, encoding or carrying a set of instructions for execution by a processor or that cause a system to perform any one or more of the methods or operations disclosed herein. As used herein, the term "computer readable medium" is expressly defined to include any type of computer readable storage device and/or storage disk and to exclude propagating signals, to exclude transitory signals, and to exclude transmission media. As used herein, the term "non-transitory" refers to storing information on the computer readable medium for any duration (e.g., permanently, for long durations (e.g., minutes, days, etc.), for temporarily buffering and/or for caching, etc.).

The example input devices **2508** include any device that facilitates a user interacting with the processor platform **2500** to, for example, enter data and commands. The input devices **2508** include, for example, a microphone, a camera, a keyboard, a button, a mouse, a touch screen, a controller, a gesture recognition device, and/or a voice recognition system.

The example output devices **2510** include any device to facilitate communication of data and/or status to a user. Example output devices **2510** include instrument cluster outputs (e.g., dials, lighting devices), actuators, a heads-up display, a display (e.g., a liquid crystal display ("LCD"), an organic light emitting diode ("OLED") display, a flat panel display, a solid state display, etc.), and/or speakers.

The example network devices **2512** include any suitable communication device that facilitates communication with the end-user devices **106** over an external network. The external network(s) may be a public network, such as the Internet; a private network, such as an intranet; or combinations thereof, and may utilize a variety of networking protocols now available or later developed including, but not limited to, TCP/IP-based networking protocols.

FIG. **26** is a block diagram of electronic components **2600** of the end-user devices **106** that are capable of executing instructions to implement the method methods of FIGS. **16-22**, and **24**. The end-user devices **106** may include computers, smart phones, tablets, optical head-mounted displays, augmented reality smart glasses, and/or virtual reality headsets, etc. In the illustrated example, the electronic components **2600** include a processor **2602**, memory **2604**, storage **2606**, input devices **2608**, network modules **2610**, a display **2612**, a front-facing camera **2614**, a back-facing camera **2616**, speakers **2618**, and/or a GPS receiver **2620**. The end-user devices **106** may include other sensors (e.g., altimeter, magnetometer, accelerometer, LiDAR, RADAR, etc.) depending on the type of the end-user device **106**.

The processor or controller **2602** may be any suitable processing device or set of processing devices such as, but not limited to: a microprocessor, a controller-based platform with multiple processing cores, a suitable integrated circuit, one or more field programmable gate arrays (FPGAs), and/or one or more application-specific integrated circuits (ASICs). In the illustrated example, the processor **2602** is structured to include the example query generator **1400**.

The memory **2604** may be volatile memory (e.g., RAM, which can include non-volatile RAM, magnetic RAM, ferroelectric RAM, and any other suitable forms); non-volatile memory (e.g., disk memory, FLASH memory, EPROMs, EEPROMs, memristor-based non-volatile solid-state memory, etc.), unalterable memory (e.g., EPROMs), and/or read-only memory. In some examples, the memory **2604** includes multiple kinds of memory, particularly volatile memory and non-volatile memory. The storage **2606** includes high-capacity storage devices, such as hard drives and/or solid state drives, etc. The memory **2604** and/or the storage **2606** may store information used by the ARPE **100** and the end-user device **106** to identify the user and maintain and/or establish a session.

The memory **2604** and storage are computer readable media on which one or more sets of instructions, such as the software for operating the methods of the present disclosure can be embedded. The instructions may embody one or more of the methods or logic as described herein. In a particular embodiment, the instructions may reside completely, or at least partially, within any one or more of the memory **2604**, the storage **2606**, and/or within the processor **2602** during execution of the instructions.

The input devices **2608** are any suitable devices to facilitate receiving input of queries **104**, browse query results **102**, and select of elements on the interfaces of FIGS. **6-11**. The input devices **2608** include, for example, a microphone, the cameras **2614** and **2616**, a keyboard, a button, a mouse, a touch screen, a controller, a gesture recognition device, a gaze detection device, and/or a voice recognition system.

The network modules **2610** include communication devices that facilitate wired or wireless communication to the ARPE **100** via the external network. The network modules **2610** may include communication controllers for mobile networks (e.g., Global System for Mobile Communications (GSM), Universal Mobile Telecommunications System (UMTS), Long Term Evolution (LTE), LTE Advanced, Code Division Multiple Access (CDMA), etc.), wireless networks (e.g., WiMAX (IEEE 802.16m); local area wireless network (including IEEE 802.11 a/b/g/n/ac or others) and/or Wireless Gigabit (IEEE 802.11ad), etc.), 5th generation (5G) wireless system, and/or wired networks (e.g., an Ethernet network, etc.).

The display **2612** is any suitable device to display the interfaces of FIGS. **6-11** to the user. The display **2612** may include a heads-up display, a monitor or screen display (e.g., a liquid crystal display ("LCD"), an organic light emitting diode ("OLED") display, a flat panel display, a solid state display, etc.), a virtual reality display (e.g., a monocular head mounted display or a binocular head mounted display), a waveguide display, a liquid crystal on silicon (LCOS), etc.

The cameras **2614** and **2616** capture still images and video. In the illustrated example, the electronic components **2600** include the front-facing camera **2614** and the back-facing camera **2616**. The front-facing camera **2614** is positioned on the end-user device **106** on the same side as the display **2612** to capture images and video of, for example, the user. In some examples, the front-facing camera **2614** is used to track the location of the eyes of the user. The back-facing camera **2616** is positioned on the end-user device **106** on the opposite side as the display **2612**. In some examples, the back-facing camera **2616** is used to track gestures of the users.

The GPS receiver **2620** provides the coordinates of the end-user device **106**. In some examples, the GPS receiver **2620** includes an inertial navigation system. The GPS receiver **2620** may also include an accelerometer to determine the orientation of the end-user device **106**. For example, the GPS receiver **2620** may provide the orientation of the end-user device relative to the direction the camera(s) **2414** and **2416** are pointing.

FIG. **27** depicts a law enforcement map interface **2700** presented by the end-user device **106** of FIG. **1** to facilitate generating the search query **104** and presenting and interacting with the query results **102** related to law enforcement and emergency services (e.g., federal, state, county and municipal law enforcement, fire departments, ambulance services, etc.). Additionally, in some examples, the a law enforcement map interface **2700** facilitates generates event reports to be processed by the augmented reality platform entity (ARPE) **100** and entered into the augmented reality platform (ARP) database **112**. In some such examples, a portion of the ARP database **112** used to populated the law enforcement map interface **2700** is segregated from the portion of the ARP database **112** used to populated other interfaces (e.g., the map interface **1000** of FIG. **10**, etc.). In the illustrated example, the map query interface **520** displays a map **2702**. The map may be selected via one of the result interfaces (e.g., interfaces **600**, **700**, and **800** of FIGS. **6**, **7**, and **8**, above). The law enforcement map interface **2700** includes interactive indicia **2704** of events relating to law enforcement and/emergency service activities. In the illustrated example, the law enforcement map interface **2700** also includes the scrubber track **606**, the event points **608**, and/or the position marker **614** to facilitate navigating though the events (e.g., as represented by the interactive indicia **2704**) with different chronological time frames. The scrubber track **606**, the event points **608**, and/or the position marker **614** facilitate sorting and browsing the information chronologically in varying degrees of granularity. For example, the information may be browsed hourly, daily, monthly, and/or yearly, etc. The interactive indicia **2704** are chronologically sorted. Using the scrubber track **606**, the event points **608**, and/or the position marker **614**, a user browses the interactive indicia **2704** chronologically. In such a manner, the user may reconstruct movements and/or visualize an order of events.

In some examples, the interactive indicia **2704** is displayed on the law enforcement map interface **2700** cumulatively by timestamp or discretely by timestamp. For example, when displayed cumulatively by timestamp, sliding the position marker **614** to a "TODAY" position may display all the interactive indicia **2704** that occurred that day and sliding the position marker **614** to a "THIS WEEK" position may display all the interactive indicia **2704** that occurred that week. As another example, when displayed discretely by timestamp, sliding the position marker **614** to a "now" position may only display the current interactive indicia **2704** and sliding the position marker **614** to a "10:00-10:00 AM" position may only display the interactive indicia **2704** that occurred from 10:00 AM to 10:10 AM.

The interactive indicia **2704** represent events of interest that become search query **104** when interacted with. For example, the interactive indicia **2704** may represent a person, place, or event relevant to law enforcement and/or emergency services activity. When a user interacts with (e.g., via a touch screen of the end-user device **106**, etc.), the law enforcement map interface **2700** submits the search query **104** related to the interactive indicia **2704** to the ARPE **100**. The law enforcement map interface **2700** provides the query results **102** in hierarchies (e.g., the hierarchies **702**, **704**, and **706** of FIG. **7** above) to facilitate the user interacting with the query results **102**.

To process the search query **104**, the ARPE **100** is communicatively coupled to content database providers **108** that are specialized in law enforcement and emergency service data. For example, the content database providers **108** may include gun registration databases, crime report databases, cell phone tracking databases, closed-circuit television (CCTV) video databases, license plate recognition (LPR) databases, vehicle registration databases, drivers license databases, shot identification databases (e.g., ShotSpotter® etc.), governmental alert databases (e.g., managed by the National Weather Service, etc.), police, fire, military, or other types of governmental report databases, body camera image databases, law databases, evidence databases, and/or personnel databases, etc. Additionally, in some examples, the ARPE **100** is communicatively coupled to

live-updating data sources, such as real-time tip databases, emergency call databases (e.g., 911 calls, etc.), emergency alert databases (e.g., fire alerts, Amber alerts, etc.), vehicle and/or phone tracking databases, and/or police and/or emergency personnel dispatch databases, etc. Additionally, in some examples, the ARPE **100** is communicatively coupled to an emergency dispatch system to forward emergency alerts and/or eyewitness alerts when the alerts are received from the end-user devices **106**.

In some examples, the interactive indicia **2704** represent moving objects, such as of police cars, cars, bicycles, individuals (e.g., via cell phone signal, etc.). This facilitates tracking objects of interest and/or knowing potential support resources before a user responds to an emergency call. Additionally or alternatively, in some examples, the interactive indicia **2704** represent crime reports. Additionally or alternatively, in some examples, the interactive indicia **2704** represent reports of gunshots. For example, using the position marker **614**, an investigator may browse the history of a person, place, or event in connection with the interactive indicia **2704** representing a gunshot. As another example, by interacting with a particular interactive indicia **2704** representing a gunshot, a search query **104** is generated with a person, place and/or event connected with the gunshot as the query term(s). Additionally or alternatively, in some examples, the interactive indicia **2704** represent emergency calls (such as to 911, etc.) and emergency incidents (e.g., a fire, a traffic accident, etc.). For example, using the position marker **614**, a user may chronologically browse persons, places, and/or events related to the emergency call or emergency incident related to the event represented by the interactive indicia **2704**. Additionally or alternatively, in some examples, the interactive indicia **2704** represent license plate numbers of interest flagged in a database detected by a LPR reader. For example, using the position marker **614**, a user may chronologically browse persons, places, and/or events related to the license plate represented by the interactive indicia **2704**.

Additionally or alternatively, in some examples, the interactive indicia **2704** represent when body cameras equipped to law enforcement officers are turned off. For example, a precinct captain may used the law enforcement map interface **2700** to track the state of the body cameras equipped to police officers in the relevant precinct and navigate, using the position marker **614** to analyze, chronologically, places and events in connection with the state of the police officers' body cameras. Additionally or alternatively, in some examples, the interactive indicia **2704** represent social media posts regarding persons or events associated with a particular location. Additionally or alternatively, in some examples, the interactive indicia **2704** represent general alerts, such as road closures and protest locations, etc.

In some examples, when the ARPE **100** is communicatively coupled to a navigation and/or traffic database, the query result **102** includes directions to be displayed on the map **2702** to provide a safe and/or fast route to a destination (e.g., a location represented by the interactive indicia **2704**).

In some examples, the law enforcement map interface **2700** facilitates a user generating,via the query generator **1400**, report of accidents or emergencies. Additionally or alternatively, in some examples, via the law enforcement map interface **2700**, the user provides crime tips (e.g., anonymously) and/or eye witness images and/or video. In some such examples, the GPS coordinates of the end-user device **106** and the current time are included in the report in order for the ARPE **100** to generate a corresponding interactive indicia **2704**. In some examples, via the law enforcement map interface **2700**, a user reports violations of municipal code (e.g., parking violations, etc.) in order for the ARPE **100** to generate a corresponding interactive indicia **2704**. In some such examples, when the query generator **1400** generates the event to send to the ARPE **100**, the query generator **1400** collects data from the input devices **2608** of the end-user device **106** to include in with the event report. For example, when the end-user device **106** includes a LiDAR or plenoptic camera, geometry, direction of camera, and/or viewing angle, etc. of the camera may be included in the event report.

In some examples, the law enforcement map interface **2700** includes an emergency mode that automatically generates emergency reports that include GPS coordinates and/or images and/or video from a camera of the end-user device **106**. In such examples, the law enforcement map interface **2700** provides a notification when the emergency report is acknowledged by the recipient. Additionally or alternatively, in some examples, the law enforcement map interface **2700** provides an interface to live stream video and/or audio from the end-user device **106** that may be indexed so that other users can view/listen to the stream via interacting with a corresponding interactive indicia **2704**.

In some examples, via the law enforcement map interface **2700**, specific interactive indicia **2704** are creatable to assign specific law enforcement personnel, vehicles, support personnel and/or equipment to a location and/or event represented by another interactive indicia **2704**.

In some examples, the ARPE **100** tracks the location of the end-user device **106** and provides an alert to the end-user device **106** when the end-user device **106** leaves a defined area (such as a precinct or a patrol route, etc.).

In some examples, via the law enforcement map interface **2700**, using the input devices **2608** of the end-user device **106**, the user provides data (e.g., dates, locations, events, persons, etc.) regarding evidence to be uploaded to the ARPE **100** and indexed into the ARP database **112**.

In some examples, the law enforcement map interface **2700** facilitates using the input devices **2608** of the end-user device **106** to scan and verify an officer's ID (such as a badge with a badge number) to verify the identity of the officer.

In some examples, the law enforcement map interface **2700** is organized into layers. Each layer is associated with different types or groups of types of the interactive indicia **2704**. For example, a first layer may be associated with interactive indicia **2704** representative of gunshots and a second layer may be associated with interactive indicia **2704** representative of 911 calls. In such examples, the law enforcement map interface **2700** includes a layer navigation interface **2706** to facilitate choosing which layer, and thus which interactive indicia **2704** are displayed on the law enforcement map interface **2700**. In some such examples, multiple layers are selectable to display multiple types of interactive indicia **2704** on the law enforcement map interface **2700**.

FIG. **28** illustrates the augmented reality interface **1102** of FIG. **11** providing location specific sporting event content superimposed on live images captured by the end-user device **106** of FIG. **1**. The end-user device **106** provides its location to the ARPE **100** (e.g., via the pre-query data **1408**). The ARPE **100** determines whether one of the content database providers **108** associated with a stadium corresponding to the location of the end-user device **106** is providing location specific content **2302**. The location specific content **2302** is content that is being generated in near real-time (e.g., there may be a delay between the creation of the content for processing and/or indexing, etc.) for users

located at the venue. For example, the location specific content may be closed captioning of an announcer and/or athlete tracking data used to track the position of specific athletes **2802** on the field/court/pitch. In some examples, the ARPE **100** provides the location specific content **2302** via the pre-query response **1410**. In some such examples, as long as enabled, the ARP **100** continuously pushes the location specific content **2302** to the end-user device **106** via the pre-query response **1410**.

If enabled, the location specific content **2302** is displayed by the augmented reality query interface **522** by superimposing the location specific content **2302** on the image being captured by the camera(s) (e.g., the cameras **2614** and **2616** of FIG. **26** above) of the end-user device **106**. In some examples, the location specific content **2302** is displayed on a specific highlighted and/or outlined object **1104**. In the illustrated example, the location specific content **2302** includes closed captioning of announcements and/or commentary regarding the sporting event. Additionally, in the illustrated example, the augmented reality interface **1102** provides tracking of specific athletes **2802** and, upon interaction with one of the athletes **2802** via, for example, a touch screen of the end-user device **106**, displays the abbreviated query panel **1106** for topics associated with that athlete **2802**. To facilitate aligning the athlete tracking data with the location of the athlete on the screen of the end-user device **106**, the end-user device provide camera field of view and orientation data to the ARPE **100**. When the user interacts with the abbreviated query panels **1106**, the augmented reality query interface **522** generates and sends the search query **104** regarding the corresponding topic to the ARPE **100**.

In some example, the location specific content **2302** includes videos, images, and/or audio that is accessible to the user while the end-user device **106** is with a region defined by a geofence (e.g., with a radius of the stadium, etc.). This content may be timed and/or curated to provide relevant information to the user while the sporting event is not currently active (e.g., during pre-game and/or half-time, etc.). In some examples, this content is pushed to the end-user device **106** when such a feature is enabled.

In some examples, the augmented reality interface **1102** superimposes other information, such as the score, on the images captures by the cameras. In some such examples, the superimposed information becomes a search query **104** when the user interacts with the information. In some such examples, the query results **102** are presented in hierarchies (e.g., the hierarchies **702**, **704**, and **706** of FIG. **7** above) to facilitate the user interacting with the query results **102**.

In some examples, the augmented reality interface **1102** provides directions to and from a venue superimposed on the images captures by the cameras. Additionally, in some examples, the augmented reality interface **1102** provides directions to a user's seat within the stadium and/or to various concession stands within the stadium.

In some examples, the augmented reality interface **1102** may superimpose user generated content onto the images captured by the camera based on a geotag in the content. For example, when a user in the stadium posts a public social media post that is tagged with coordinates within the stadium, the augmented reality interface **1102** displays the social media post proximate those coordinates.

In some examples, the augmented reality interface **1102** provides a catalogue **2804** of items or services available at the stadium. Using the seat assignment and/or GPS coordinates, the ARPE **100** associates orders and/or requests made via the catalogue **2804** to the location of the end-user device **106**. In such a manner, the items and/or services ordered through the catalogue **2804** may be delivered to the user. Additionally or alternatively, through the augmented reality interface **1102**, the user alerts the venue to an emergency and includes GPS coordinates, seat assignment, and/or data captured by the input devices **2608** of the end-user device **106** (e.g., video, images, audio, etc.). In some such examples, the ARPE **100** transforms the alert into an interactive indicia **2704** on a law enforcement map interface **2700** used by emergency responders at the venue.

In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides real estate information (e.g., purchase history, county recorder's history, crime statistics, relevant news pertaining to the location, shopping opportunities. school district, etc.). In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides ancestry information that associates locations (e.g., immigration locations, birth locations, death locations, grave locations, marriage locations, etc.) with people and dates. Additionally, the ancestry information associates people together in family trees. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides traffic data to facilitate providing traffic information in augmented reality, virtual reality and/or mixed reality. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides weather data to facilitate providing weather information in augmented reality, virtual reality and/or mixed reality. In some examples, the weather data includes geometry data that provides a three dimensional construct of the weather that can be incorporated into one of the interfaces discussed above.

In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides survey and/or election result data. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides census data. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides financial data (e.g., stock market data, etc.). In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides flight navigation data to track, for example, aircraft and/or unmanned aerial vehicles in the law enforcement map interface **2700**. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides academic data (e.g., published papers in journals, etc.), scientific data, and/or research data. In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides agricultural data (e.g., soil data, weather data, crop data, fertilizer use data, planting history data, etc.).

In some examples, the ARPE **100** is communicatively coupled to a content database provider **108** that provides medical data and/or hospital data (e.g., patient location and health data, patient geometry data, etc.) to facilitate patient care in a medical facility. For example, a hospital floor plan may the map in the map interface **1000**. In such an example, the interactive indicia **2704** may be generated for patients and clinical events. As another example, medical data, such as X-rays or CAT scans can be superimposed onto images captured by the camera in the augmented reality query interface **522** using the patient geometry data to facilitate viewing the medical data on the patient.

In some examples, the map query interface **520** is used as a fleet management tool where locations and timestamps for vehicles are transformed into the interactive indicia **2704** to

be displays and chronologically tracked. Additionally, the user may create specific events to direct vehicles to locations at certain times so that those planned events are displayed in the map query interface **520** of, for examples, drivers and/or other fleet management personnel.

In this application, the use of the disjunctive is intended to include the conjunctive. The use of definite or indefinite articles is not intended to indicate cardinality. In particular, a reference to "the" object or "a" and "an" object is intended to denote also one of a possible plurality of such objects. Further, the conjunction "or" may be used to convey features that are simultaneously present instead of mutually exclusive alternatives. In other words, the conjunction "or" should be understood to include "and/or". The terms "includes," "including," and "include" are inclusive and have the same scope as "comprises," "comprising," and "comprise" respectively.

The above-described embodiments, and particularly any "preferred" embodiments, are possible examples of implementations and merely set forth for a clear understanding of the principles of the invention. Many variations and modifications may be made to the above-described embodiment(s) without substantially departing from the spirit and principles of the techniques described herein. All modifications are intended to be included herein within the scope of this disclosure and protected by the following claims.

What is claimed is:

1. A method comprising:

presenting, on a display of an end-user device, live image data being captured by a camera of the end-user device;

determining a pose of the end-user device, the pose including a location of the end-user device;

sending the pose of the end-user device to an augmented reality platform entity;

receiving closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including an indication of a first topic embedded within the closed captioning data; and

superimposing the closed captioning data incorporating an interactive element associated with the first topic onto the live image data, wherein the first topic includes a query panel associating the first topic with the interactive element.

2. The method of claim **1**, including highlighting objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic.

3. The method of claim **2**, wherein highlighting the objects of interest in the displayed live image data being captured by the camera includes:

sending the pose of the end-user device to an augmented reality platform entity, the pose including the location and orientation of the end-user device;

receiving the objects of interest from the augmented reality platform entity based on the pose of the end-user device.

4. The method of claim **2**, wherein superimposing the closed captioning data onto the live image data includes superimposing the closed captioning data onto one of the objects of interest.

5. The method of claim **2**, including in response to receiving a selection of one of the objects of interest associated with second topics, sending a query to the augmented reality platform entity that includes the corresponding one of the second topics.

6. The method of claim **5**, including, in response to receiving a query result from the augmented reality platform entity:

presenting a scrubber track, a scrubber, and a plurality of event points, the plurality of event points indicative chronological categories associated with the query result; and

displaying a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

7. The method of claim **1**, including in response to receiving a selection of the interactive element within the displayed closed captioning data, sending a query to the augmented reality platform entity that includes the corresponding first topic.

8. The method of claim **1**, wherein receiving the closed captioning data from the augmented reality platform entity includes receiving the closed captioning data in response to being within an area defined by a geofence.

9. The method of claim **1**, wherein content of the closed captioning data is based on the location of the end-user device and a pose of the end-user device.

10. An end-user device comprising:

memory with an application; and

a processor communicatively coupled to the memory, the application, when executed, causing the processor to:

present, on a display, live image data being captured by a camera of the end-user device; determine a pose of the end-user device, the pose including a location of the end-user device;

send the pose of the end-user device to an augmented reality platform entity;

receive closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including an indication of a first topic embedded within the closed captioning data; and

superimpose the closed captioning data incorporating an interactive element associated with the first topic onto the live image data, wherein the first topic includes a query panel associating the first topic with the interactive element.

11. The end-user device of claim **10**, wherein the application, when executing, causes the processor to highlight objects of interest in the displayed live image data being captured by the camera, the objects of interest associated with a topic.

12. The end-user device of claim **11**, wherein to highlight the objects of interest in the displayed live image data being captured by the camera, the application, when executing, causes the processor to:

send the pose of the end-user device to an augmented reality platform entity, the pose including the location and orientation of the end-user device;

receive the objects of interest from the augmented reality platform entity based on the pose of the end-user device.

13. The end-user device of claim **11**, wherein to superimpose the closed captioning data onto the live image data, the application, when executing, causes the processor to superimpose the closed captioning data onto one of the objects of interest.

14. The end-user device of claim **11**, wherein the application, when executing, causes the processor to, in response

to receiving a selection of one of the objects of interest associated with second topics, send a query to the augmented reality platform entity that includes the corresponding one of the second topics.

15. The end-user device of claim **10**, wherein the application, when executing, causes the processor to, in response to receiving a selection of interactive element within the displayed closed captioning data, send a query to the augmented reality platform entity that includes the corresponding first topic.

16. The end-user device of claim **15**, wherein the application, when executing, causes the processor to, in response to receiving a query result from the augmented reality platform entity:

present a scrubber track, a scrubber, and a plurality of event points, the plurality of event points indicative chronological categories associated with the query result; and

display a first hierarchy of a plurality of hierarchies associated with records included in the query result associated with one of the chronological categories selected by a position of the scrubber on the scrubber track corresponding to an associated one of the plurality of event points.

17. A tangible computer readable medium comprising instructions that, when executed, cause an end-user device to:

present, on a display of an end-user device, live image data being captured by a camera of the end-user device;

determine a pose of the end-user device, the pose including a location of the end-user device;

send the pose of the end-user device to an augmented reality platform entity;

receive closed captioning data from the augmented reality platform entity, the closed captioning data based on the location of the end-user device and including a visual indication of a first topic embedded within the closed captioning data; and

superimpose the closed captioning data incorporating an interactive element associated with the first topic onto the live image data, the visual indication linking the first topic with the interactive element.

18. The tangible computer readable medium of claim **17**, wherein the visual indication includes a query panel.

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